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ABSTRACT

This is a list of curriculum improvement materials produced by major course and curriculum projects supported by the National Science Foundation's Division of Pre-College Education in Science. The materials are grouped by educational level (elementary, intermediate, and secondary) and within each level by broad discipline groupings (mathematics, science, and the social sciences). Under the science grouping, materials are found on astronomy, biology, chemistry, oceanography, meteorology, and physics. The materials include films, books, and instructional equipment. Appended are lists of abbreviations, grantee institutions, project numbers, directors and projects, and materials produced for foreign countries. (BB)

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Course and Curriculum Improvement Materials

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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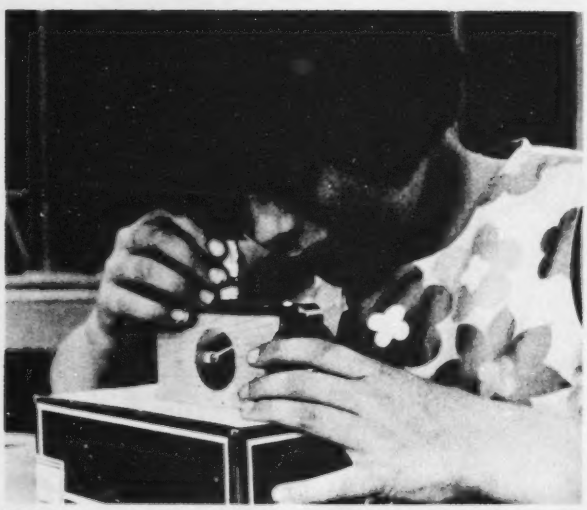
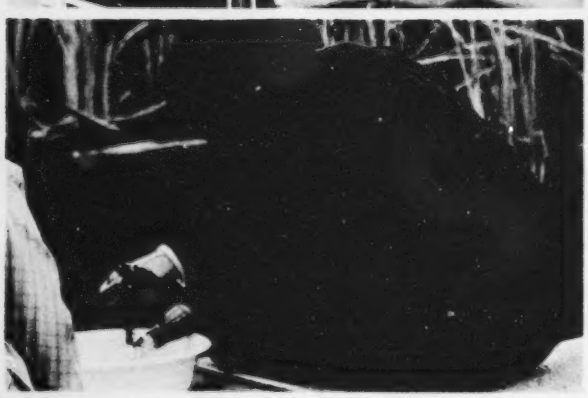
MATHEMATICS
SCIENCE
SOCIAL SCIENCES

ELEMENTARY
INTERMEDIATE
SECONDARY





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The National Science Foundation does not recommend the adoption of any specific book, film, piece of apparatus, course, or curriculum. Decisions on what to teach remain, in the healthy American tradition, the exclusive responsibility of individual schools and teachers. It is hoped, however, that the products of these projects will prove to merit serious consideration by all concerned with education at the pre-college level.

Course and Curriculum Improvement Materials

MATHEMATICS
SCIENCE
SOCIAL SCIENCES

- Curriculum Development
- Textbooks
- Laboratory Guides
- Resource Materials for Teachers
- Supplementary Materials for Students
- Equipment Development
- Films
- Educational Research

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INTRODUCTION

This listing of course and curriculum project materials supplements descriptions in, and is a companion to, *Course and Curriculum Improvement Projects* (June 1974), NSF E 74-30. It provides an easy reference to many of the textbooks and other instructional materials for elementary and secondary schools produced by major course and curriculum projects supported, in whole or in part, by the National Science Foundation's Division of Pre-College Education in Science. It updates and replaces the pre-college portions of NSF 68-24, *Released Textbooks, Films and Other Teaching Materials* (July 1968), and NSF E 66-P-28, *Translations, and Adaptations of Instructional Materials for Other Countries* (December 1966).

Project materials are grouped by educational level (elementary, intermediate, and secondary), and within each level by broad discipline groupings (mathematics, science, and the social sciences). Within each subsection, projects appear in reverse chronological order with a few exceptions. The order of listing follows that of *Course and Curriculum Improvement Projects* (E 74-30). Project numbers are identical to those identifying the same projects in that publication. No information beyond that of the project heading is provided in those cases where (a) project purposes did not include production of instructional materials, (b) materials and their availability were fully covered in NSF E 74-30, (c) materials are still in developmental stages and not as yet ready for general distribution, and (d) distribution arrangements are incomplete.

Each project heading begins with the official title, except when a project produced one textbook, one course, or a single definitive curriculum. In such a case, the title of the book, course, or curriculum precedes the official title. Dates indicate the period in which a project operated under Foundation support although the listing may include related materials produced with other prior or later support. The project director address and that of the grantee institution follow. When the project director and the grantee institution are not at the same location, identification of the grantee institution appears in parentheses.

For each project, the principal type of product appears first, followed by other categories of materials. Subject headings or individual titles, as appropriate, are followed by three dots and an alphabetic code that identifies the U.S. publisher(s), distributor(s), or supplier(s). Alphabetic codes are listed separately following material groupings to identify languages and the publishers or distributors who have arranged for translations or adaptations and foreign sales. In some projects materials may not yet have been published in the foreign languages indicated; in most projects translation and sales are indicated for some but not all of the materials listed. Somewhat more specific information is listed in Appendix C, but it will be necessary to write to the publisher for complete and current information on availability by language and title.

Appendix A lists acronyms and the curricula to which they refer, and is an index to corresponding project numbers. Appendix B is an alphabetic listing of project directors and is an index to numbers of the projects they direct. Appendix C is an outline identifying foreign language translations, adaptations, and English versions of the materials sold in other countries, by language, and within language by discipline. Appendix D lists alphabetic codes for languages and the languages they identify, as well as alphabetic codes and the full names and addresses of both domestic and foreign publishers and distributors.

I. ELEMENTARY SCHOOL PROJECTS

A. Mathematics

1. SCHOOL MATHEMATICS STUDY GROUP (SMSG). 1958-1972. **E. G. Begle,** School of Education, Stanford University, Stanford, California 94305. (Original grantee: Yale University, New Haven, Connecticut 06520. 1958-1961.)

See number 76 for project materials.

2. THE ARITHMETIC PROJECT. 1965-1970. **David A. Page,** Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160. (Current contact: Jack Churchill.)

a. Text in mathematics for elementary school teachers
Number Lines, Functions, and Fundamental Topics (Page) ..... **MPC**

b. *Guide for Course Leaders* ..... **EDC**

c. Discussion Notes ..... **AP**
(NOTE: Corresponding films are listed by corresponding numbers under "d" below.)

Book 1. *Introduction to Frames and Number Line Jumping Rules* Supplement: *Answers to Common Questions About the Course*
Book 2. *Consecutive Jumps; Distances Jumped; Competing Number Line Rules* Supplement: *Computing With Positive and Negative Numbers*
Book 3. *Parentheses and "Multiplying Before You Add;" Standstill Points* Supplement: *Answers to Common Questions About the Film "Standstill Points"*
Book 4. *Effects of Using Rules in Different Orders* Supplement: *Dividing by Zero*
Book 5. *Introduction to Maneuvers on Lattices* Supplement: *Manuevers on Lattices*
Book 6. *Frame Equations; Midpoints; Some Wrong Answers; Absolute Value* Supplement: *Ways to Find How Many*

Book 7. *Lower Brackets* Supplement: *Using Centimeter Blocks to Introduce Prime Numbers to a Third Grade*
Book 8. *Lower Brackets and Upper Brackets* Supplement: *Arithmetic With Frames*
Book 9. *Maneuvers on Lattices (continued)* Supplement: *More Suggestions for Lattices*
Book 10. *"Surrounding" With Centimeter Blocks* Supplement: *Using Blocks to Introduce Other Bases of Numeration to a Fourth Grade*
Book 11. *Artificial Operations; Competing Rules* Supplement: *Well-Adjusted Trapezoids*
Book 12. *More Work With Artificial Operations* Supplement: *Functions*
Book 13. *Graphing Equations With Lower and Upper Brackets* Supplement: *Graphing Number Line Jumping Rules, Part One*
Book 14. *Two Points to Two Points on a Number Line* Supplement: *Graphing Number Line Jumping Rules, Part Two*
Book 15. *Rules Moving Two Points; Composition of Number Line Rules* Supplement: *Examples of Questions Dealing with* □ + □X□
Book 16. *Composition (continued)* Supplement: *More Problems With Composition of Number Line Rules*
Book 17. *Simultaneous Equations; Points and Lines in a Plane* Supplement: *Graphing Simultaneous Equations*
Book 18. *Number Plane Jumping Rules* Supplement: *Composing Number Line Rules to Move Two Points to Two Points*
Book 19. *Number Plane Rules (continued)* Supplement: *More Work With Number Plane Rules*
Book 20. (Discussion of last lesson) Supplement: *Hybrid Rules: Jumping Rules from the Line to the Plane and from the Plane to the Line*

d. Films ..... **AP**
1. *A First Class With Number Line Rules and Lower Brackets, Grade 5*
2. *Which Rule Wins? Grade 3*
3. *Standstill Points, Grade 5*
4. *Three A's, Three B's and One C, Grade 5*
5. *A Seven-Fold Lattice, Grade 5*
6. *Counting With Dots, Grade 2*
7. *Lower and Upper Brackets, Grade 4*
8. *Inequalities With Lower Brackets, Grade 5*
9. *A Periodic Lattice, Grade 5*
10. *Surface Area with Blocks, Grade 1*
11. *Some Artificial Operations, Grade 4*
12. *Frames and Number Line Jumping Rules, Grade 5*
13. *Graphing With Square Brackets, Grade 5*
14. *Competing Number Line Rules, Grade 5*
15. *Rules Moving Two Points, Grade 5*
16. *Introduction to Composition, Grade 5*
17. *Graphing Absolute Value Equations, Grade 2*
18. *Jumping Rules in the Plane, Part One, Grade 6*
19. *Jumping Rules in the Plane, Part Two, Grade 6*
20. *Rotations in the Plane, Grade 5*

e. *Ways to Find How Many* (Page) ..... **EDC**

f. *Maneuvers on Lattices—An Example of "Intermediate Invention"* (Page) ..... **EDC**

3. IN-SERVICE FILMS IN MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS. 1963-1966.

Harry D. Ruderman, Hunter College High School, 930 Lexington Avenue, New York, New York 10020. (Grantee: National Council of Teachers of Mathematics (NCTM), 1906 Association Drive, Reston, Virginia 22091.)

a. Film Series (16mm, sound, color) ..... **UEVA**
Beginning Number Concepts (30 min.)
Development of Our Decimal Numeration System (27 min.)
Addition and Its Properties (29 min.)
Multiplication and Its Properties (30 min.)
Subtraction (29 min.)
Division (29 min.)
Addition and Subtraction Algorithms (21 min.)
Multiplication Algorithms and the Distributive Property (24 min.)
Division Algorithms (29 min.)
The Whole Number System—Key Ideas (27 min.)

b. The text, *Mathematics for Elementary School Teachers,* coordinated with the film series ..... **NCTM**

4. MADISON MATHEMATICS PROJECT (MAD-M). 1961- . **Robert B. Davis,** Curriculum Laboratory, University of Illinois, 1210 West Springfield Avenue, Urbana, Illinois 61801. (Grantee: Webster College, St. Louis, Missouri 63119.)

a. The following materials are available from the project:
1. *In-Service Course I*—A package of films and printed materials for teacher workshops.
2. *In-Service Course II*—A sequel to *In-Service Course I.*
3. *Journal of Children's Mathematical Behavior,* Vol. 1, No. 1. Contains a recent overall description of Madison Project activity. Vol. 1, No. 2. Contains analytical studies of children's mathematical thinking.
4. Assorted films (e.g., *A Lesson with Second Graders; Graphing a Parabola; Outdoor Mathematics).*

b. Texts ..... **AWP**
Discovery in Mathematics (Davis) A text for teachers and a student discussion guide.
Exploration in Mathematics (Davis) A text for teachers and a student discussion guide.

c. Film Series, *A Concrete Approach to Elementary Ideas in Mathematics* (16 mm, b&w, sound), with an accompanying booklet of the same title .. **HMC**
Readiness for Place Value Numerals
Sixth Grade Lesson on Place Value Numerals
Subtraction Using Beans
Addition and Multiplication Using Plastic Washers
Addition and Division Using Beans and Beansticks
Subtraction and Division Using Beans and Beansticks
Experience with Fractions: Suppose It Comes Out Even?
Experiences with Fractions: Suppose It Doesn't Come Out Even?
Fractions and Meaning of Division
Fractions on the Number Line Using String
Number Line Using the Overhead Projector
Area, Using Geoboards

d. Activity packages
   1. Independent Exploration Material .. **MMG**
      Shoebox Kits contain instruction cards and other materials to be used independently in Grades 5-8:
      Geoboard and Workcards
      Tower Puzzle and Workcards
      Centimeter Blocks and Workcards
      Weights, Strings and Workcards
      Peg Game and Workcards
   2. The Strip Puzzle (Peg game), Pyramid Puzzle (Disc) and Geoboard (Nailboard) can be purchased commercially from many sources. For example: Concept Company, Box 273, Belmont, Massachusetts 02178; Math Media Division, H and M Associates, Box 1107, Danbury, Connecticut 06810; Selective Educational Equipment, 3 Bridge Street, Newton, Massachusetts 03158; and other places.

5. EXPERIMENTAL TEACHING OF MATHEMATICS IN THE ELEMENTARY SCHOOL. 1959-1971. **Patrick Suppes,** Institute for Mathematical Studies in the Social Sciences, Stanford, California 94305.

a. Books ..... **API**
   Computer-assisted Instruction: Stanford's 1965-66 Arithmetic Program (Suppes, Jerman, Brain)
   Computer-assisted Instruction at Stanford, 1966-68: Data, Models, and Evaluation of the Arithmetic Programs (Suppes, Morningstar)

b. Films (16mm, optical sound, color) ..... **CCL**
   The Brentwood Project (14 min.)
   Please Type Your Name (13 min.)
   IMSSS Computer Train (4 min.)

B. Mathematics and Science

6. UNIFIED SCIENCE AND MATHEMATICS FOR ELEMENTARY SCHOOLS (USMES). 1970- . **Earle L. Lomon,** Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160.

a. Resource Books ..... **EDC**
   The USMES Guide, March 1974
   A Resource Book for USMES Resource Team Workshops (in preparation) (for teacher training)
   A Teacher Resource Book for each USMES Interdisciplinary Unit

b. Interdisciplinary Implementation units .. **EDC**
   Dice Design
   Burglar Alarm Design
   Pedestrian Crossings
   Lunch Lines
   Describing People
   Designing for Human Proportions
   Consumer Research-Product Testing
   Soft Drink Design

   Undergoing development:

   Weather Prediction
   Small Group Dynamics
   Communications
   Learning Processes
   Electromagnet Device Design
   Consumer Research Marketing
   Playground Design
   Traffic Flow

c. Other ..... **EDC**
   USMES Information Sheet
   Descriptions of USMES Units
   Design Lab Activity

7. ELEMENTARY SCHOOL MATHEMATICS AND SCIENCE PROJECT (UICSM). 1969- **Peter B. Shoresman,** School of Education, University of Illinois, Urbana, Illinois 61801.

Questions about the preliminary materials should be addressed to the project director.

8. MINNESOTA SCHOOL MATHEMETICS AND SCIENCE TEACHING (MINNEMAST). 1961-1970. **Alan Humphreys,** University of Minnesota, Minnesota School of Mathematics and Science Center, 720 Washington Avenue, S.E., Minneapolis, Minnesta 55455.

a. *Ideas in Mathematics* (Douglis) (1970) ..... **WBS**

b. MINNEMAST Coordinated Units ..... **MINNEMAST**
   Kindergarten Units
   1. *Watching and Wondering*
   2. *Curves and Shapes*
   3. *Describing and Classifying*
   4. *Using Our Senses*

5. *Introducing Measurement*
6. *Numeration*
7. *Introducing Symmetry*

Kindergarten units 1-7 include teacher manuals, printed aids, a kit, and kit refills.

Grade 1 Units[1]

8. *Observing Properties*
9. *Numbers and Counting*
10. *Describing Locations*
11. *Introducing Addition and Subtraction*
12. *Measuring and Reference Units*
13. *Interpretations of Addition and Subtraction*
14. *Exploring Symmetrical Patterns*

Grade 2 Units[1]

15. *Investigating Systems*
16. *Numbers and Measuring*
17. *Introducing Multiplication and Division*
18. *Scaling and Representation*
19. *Comparing Changes*
20. *Using Larger Numbers*
21. *Angles and Space*
22. *Parts and Pieces*

Grade 3 Units[1]

23. *Conditions Affecting Life*
24. *Change and Calculations*
25. *Multiplication and Motion*
26. *What Are Things Made Of?*
27. *Numbers and Their Properties*
28. *Mapping the Globe*
29. *Natural Systems*

c. Supplementary Books ..... **MINNEMAST**

Living Things in Field and Classroom (Teacher Handbook)

Adventures in Science and Mathematics (Stories about Scientists for Teachers and Students)

Overview (A comprehensive discussion of the curriculum)

MINNEMAST Recommendations for Math and Science in the Intermediate Grades (Transition Document)

Questions and Answers about MINNEMAST (Free)

d. Property Blocks, Minnebars, a Numberline Slide Rule, and a booklet of games and activities for grades K, 1, and 2 ..... **MINNEMAST**

e. *Experiments in Arithmetic*—Grades 5 and 6, a teacher manual (1965) ..... **MINNEMAST**

Probability Workbook (1966) ..... **MINNEMAST**

C. Science

9. CONCEPTUALLY ORIENTED PROGRAM IN ELEMENTARY SCIENCE (COPES). 1972-1973. **Morris H. Shamos,** Department of Physics, New York University, 4 Washington Place, New York, New York 10003.

Information on materials and their availability is fully covered in NSF E 74-30.

10. ELEMENTARY SCIENCE STUDY (ESS). 1962-1973. **Joseph Griffith,** Thoreau School, Concord, Massachusetts 01742. (Grantee: Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160.)

a. ESS Units ..... **M-HBC**

ESS Films—BFA
EdMC
M-HBC
MLA
UEVA

Animal Activity—A Closer Look at the Habits of Small Animals (Grades 4-6)
Teacher's Guide
Experiments on Animal Activity (student book)
Activity Wheel (material)

Animals in the Classroom—A Guide for Teachers in the Humane Use of Live Animals
Animals in the Calssroom—A Book for Teachers
The Curious Gerbils

Attribute Games and Problems—Nongraded Activities to Aid the Development of Thinking Skills (Grades K-9)
Teacher's Guide
Problem Cards
Problem Cards Spanish Edition
Stickers
Materials Kit
"A" Block Box
Color Cubes
People Pieces Box

Balloons and Gases (grades 5-8)
Teacher's Guide
Class Kits (I and II)

Batteries and Bulbs (Grades 4-6)
Teacher's Guide
Student Sheets
Class Kit

[1] Grades 1-3 units 8-29 include teacher manuals, student manuals, printed aids, a kit, and kit refills.

Batteries and Bulbs II—A Resource Book for Making all Kinds of Electrical Gadgets (Grades 5 and beyond)

Behavior of Mealworms—How to Ask Questions about Animals (Grades 4-8)
- *Teacher's Guide*
- Set of 6 Illustrations
- *How Barn Owls Hunt*
- *How a Moth Escapes from its Cocoon*

Bones—Flexible, High Interest Activities for the Middle Grades (Grades 4-6)
- *Teacher's Guide*
- *Bone Picture Book*
- *How to Make a Chicken Skeleton*
- Picture Packet (of 15 large skeleton illustrations)
- Class Kit
- Mystery Bones Kit

Film Loops:[1]
- *Head and Neck*
- *Shoulder*
- *Knee and Elbow*
- *Hand*
- *Foot*

Brine Shrimp—Observing the Life Cycle of a Living Creature (Grades K-4)
- *Teacher's Guide*
- Class Kit
- Film Loops (3-4 min; color)[1]
  - *Brine Shrimp I* (life cycle)
  - *Brine Shrimp II* (activities of adult)
- Film (16mm, silent; 7 min; color)[1]
  - *Brine Shrimp* (life cycle and activities of adult)

Budding Twigs—Opportunities To Explore Plant Structures and Characteristics (Grades 4-6)
- *Teacher's Guide*

Butterflies—Exploring the Process of Metamorphosis (Grades K-5)
- *Teacher's Guide*
- Film Loops (3-4 min; color)[1]
  - *Black Swallowtail Butterfly: Egg-Laying, Hatching, and Larvae*
  - *Black Swallowtail Butterfly: Larval Molt*
  - *Black Swallowtail Butterfly: Preparing to Pupate (1)*
  - *Black Swallowtail Butterfly: Preparing to Pupate (2)*
  - *Black Swallowtail Butterfly: Pupal Molt*
  - *Black Swallowtail Butterfly: Emergence*
- Film (16mm, silent; 18 min; color)[1]
  - *The Life Cycle of a Butterfly*

Changes—Activities Involving the Processes of Natural Change (Grades 1-4)
- *Teacher's Guide*

Clay Boats—Experiments with Floating, Sinking, and Simple Volume Relationships (Grades 2-8)
- *Teacher's Guide*
- Class Kit

Colored Solutions—Investigations with Flowing, Dissolving, Floating (Grades 3-8)
- *Teacher's Guide*
- 6-Student Kit
- Teacher's Kit

Crayfish—Finding Out about a Familiar Animal (Grades 4-6)
- *Teacher's Guide*

Daytime Astronomy—Investigations in Observational Astronomy (Grades 5-8)
- *Teacher's Guide*

Drops, Streams, and Containers—Informal Experiments with Common Liquids (Grades 3-4)
- *Teacher's Guide*
- Class Kit

Earthworms—Discovering the World of One of Man's Most Helpful Friends (Grades 4-6)
- *Teacher's Guide*
- Class Kit

Eggs & Tadpoles—Exciting Observations of An Important Biological Process (Grades K-6)
- *Teacher's Guide*
- Class Kit
- Film Loops (3-4 min.; color)[1]
  - *Frog Egg I: First Cell Division to Early Neural Fold*
  - *Frog Egg II: Development of the Body Regions*
  - *Frog Egg III: Continued Development to Hatching*
  - *Tadpoles I: Hatching through Initial Leg Growth*
  - *Tadpoles II: Metamorphosis*
- Teacher Information Film Loops (Optional Classroom use)[1]
  - *Frogs: Pairing and Egg Laying*
  - *Artificial Fertilization of Frog Eggs*
  - *Frogs: Pituitary Preparation*
- Films (16mm, silent, color)[1]
  - *Frog Development—Fertilization to Hatching* (12 min.)
  - Frog Development—Hatching through Metamorphosis (10 min.)

Gases and "Airs"—Laboratory Investigations into the Nature of Air (Grades 5-8)
- *Teacher's Guide*
- Worksheets
- 6-Student Equipment Kit
- Teacher's Equipment Kit
- Film Loops (3-4 min.; color)[1]
  - *Candle Burning Techniques*
  - *Candle Burning I*
  - *Candle Burning II*
  - *The Mouse and the Candle*

Geo Blocks—Building Materials for Children of All Ages (Grades K-6)
- *Teacher's Guide*
- Problem Cards for Geo Blocks (series of 106 cards)
- Materials Kit

Growing Seeds—Simple Investigations for Primary Age Children (Grades K-3)
- *Teacher's Guide*
- Class Kit
- Film Loops (3-4 min.; color)[1]
  - *Bean Sprouts*
  - *Plant Growth-Graphing*

Heating and Cooling—Investigating How Heat Affects the Behavior of Various Metal Materials (Grades 5-7)
- *Teacher's Guide*
- *Problem Cards for Heating and Cooling*
- 10-Student Kit

Ice Cubes—Experiments with Ice and the Factors Which Influence It (Grades 3-5)
- *Teacher's Guide*
- Class Kit

Kitchen Physics—A Look at Some Properties of Liquids (Grades 6-9)
- *Teacher's Guide*
- Worksheets
- 6-Student Equipment Kit
- Teacher's Equipment Kit
- Film Loops (3-4 min.; color) (Super 8mm)[1]
  - *Beading of a Water Column*
  - *Water Rise in Blotter Strips of Graded Width*
  - *Water Rise in Blotter Strips Exposed and Enclosed*

Life of Beans and Peas—Learning about the Life Cycle of Plants with Pods (Grades K-4)
- *Teacher's Guide*

Light and Shadows—Activities and Games for Young Children (Grades K-4)
- *Teacher's Guide*

Mapping—Representing the World with Visual Symbols (Grades 5-7)
- *Teacher's Guide*
- *Making Maps* (Student Booklet)
- *Mapping Cards*
- Class Kit

Match and Measure—A Resource Book for Classroom Teachers (Grades K-3)
- *Teacher's Guide*
- Class Kit

Microgardening—An Introduction to the Microscopic World of Living Things (Grades 4-7)
- *Teacher's Guide*
- *Illustrated Handbook of Some Common Molds*
- Basic Class Kit (Grades 4 and 5)
- Advanced Class Kit (Grades 6 and 7)
- Film Loops (3-4 min.; color)[1]
  - *Alternaria*
  - *Rhizopus*
  - *Fusarium*
  - *Penicillium*
  - *Trichoderma Growth Rings*
  - *Rotting Pear*
  - *Mushroom Growth and Reaction*

Mirror Cards—Informal Group Activities Introducing Elementary Geometric Optics and Symmetry (Grades 1-6)
- *Teacher's Guide*
- Materials for Mirror Cards

Mobiles—Beginning Experiments with Balance (Grades K-4)
- *Teacher's Guide*
- Materials for Mobiles

Mosquitoes—Raising Mosquitoes and Studying Their Behavior (Grades 3-Adult)
- *Teacher's Guide*

Musical Instrument Recipe Book—A Resource Book for Making Muscial Instruments (Grades K-Adult)
- *Teacher's Guide*

Mystery Powders—An Introduction to Investigatory Science (Grades 3-4)
- *Teacher's Guide*
- Class Kit

Optics—Examining the Fascinating Properties of Light (Grade 4-6)
- *Teacher's Guide*
- Two Light Sources and Accessories
- Class Kit

Pattern Blocks—A Group of Related Blocks That Lend Themselves to Pattern-Making (Grades K-6)
- *Teacher's Guide*
- Materials Kit

Peas and Particles—A Unit on Large Numbers and Estimations (Grades 4-6)
- *Teacher's Guide*
- *Picture Packet for Peas and Particles*
- Class Kit

Pendulums—Experiments with Some Basic Principles of Physics (Grades 4-6)
- *Teacher's Guide*
- Class Kit
- Supplies (for class of 30)
- Pendulum Supports
- Service Package
- Pendulum Bobs
- Film Loops (3-4 min.; color)[1]
  - *Sand Pendulum I: Drawing Circles, Lines, and Ellipses*
  - *Sand Pendulum II: Drawing on a Turntable*
  - *Sand Pendulum III: Drawing Lines on a Traveling Table*
  - *Sand Pendulum IV: Slowing Down*
  - *Sand Pendulum V: Pouring Sand into Soda Straws*

Pond Water—A Closer Look at the Living Creatures in Ponds (Grades 1-7)
- *Teacher's Guide*
- Pond Water Cards

Primary Balancing—Informal Activities for Children Using Weights and Balances (Grades K-4)
- *The Balance Book: A Guide for Teachers of Primary Balancing*
- Materials for Primary Balancing
- Assorted Materials

Printing—Discovering and Using An Important Means of Communication (Grades 1-6)
- *Printing Press and Materials for Printing*

Rocks and Charts—Activities for Children in the Classification of Some Common Minerals (Grades 3-6)
- *Teacher's Guide*
- Class Kit (including Rocks and Equipment)
- Rocks
- Equipment

Sand—Unusual Discoveries about a Familiar Substance (Grades 2-3)
- *Teacher's Guide*
- Class Kit
- Equipment
- Sand - six selections
- Sieves for Sand
- Multi-Purpose Balance
- Film Loops (See Pendulums)[1]

Senior Balancing—Materials for Exploring Equalities, Inequalities, Symmetry, and Graphing (Grades 4-8)
- *Teacher's Guide*
- Problem Cards for Senior Balancing
- Teacher's Kit
- 6-Student Kit

Sink or Float—Experiences with Displacement and Bouyancy (Grades 2-7)
Teacher's Guide
Equipment—6-Student Kit
Multi-Purpose Balance Package
Small Things—An Introduction to the Microscopic World (Grades 4-6)
Teacher's Guide
Worksheets
Set of 20 Illustrations
The Faithful Eye of Robert Hooke (supplementary book)
6-Student Equipment Kit
Teacher's Kit
Film Loops (3-4 min.; color)[1]
Paramecium
Euglena
Amoeba
Blepharisma
Stentor
Budding of Yeast Cells
Rotifer
Vorticella
Volvox
Stylonychia
Comparative Sizes of Microscopic Animals
Film (16mm; sound 16mm; color)[1]
Paramecium, Euglena, and Amoeba
Spinning Tables—Discovering the Curious World of Things that Move in Circles (Grades 1-2)
Teacher's Guide
Equipment
Starting from Seeds—Investigating Plant Growth (Grades 3-7)
Teacher's Guide
Stream Tables—Exploring the Effect of Water on the Contours of the Earth's Surface (Grades 4-9)
Teacher's Guide and Cards
Class Kit
Structures—Stimulating the Desire to Build and Create (Grades 2-6)
Teacher's Guide
Tangrams—A Small Group Activity Using a Geometric Puzzle (Grades K-8)
Teacher's Guide
Tangram Cards
Tangram Pieces
Tracks—Reading the Traces of Animals from Moments or Years Ago (Grades 4-6)
Teacher's Guide
Track Picture Book
Track Cards
Mystery Track Cards
Film Loop[1]
The Horse: Walk, Trot, and Gallop
Water Flow—Investigating and Learning to Control the Behavior of Water in Closed Systems (Grades 5-6)
Teacher's Guide
Idea Cards
8-Student Kit
Where is the Moon?—An Introduction to Observational Astronomy (Grades 3-7)
Teacher's Guide
Where Was the Moon? (A Student Booklet)
Whistles and Strings—Using Basic Elements of Musical Instruments to Investigate How Sounds Are Produced (Grades 3-6)
Teacher's Guide
Class Kit
ESS Units—Eng-Canada:**IRP**
Fr-Canada:**M-HRL**

b. Supplementary Science Readers (Grades 4-8) ..... **MHBC**
The Faithful Eye of Robert Hooke
How to make a Chicken Skeleton
Bone Picture Book
Illustrated Handbook of Some Common Molds
How a Moth Escapes from Its Cocoon
How Barn Owls Hunt
The Curious Gerbils
Experiments on Animal Activity
Where Was the Moon?

c. Classroom Films. For pre-service and in-service training, workshops, faculty and parent-teacher gatherings ..... **EDC**
Another Way to Learn (16mm, sound, b&w, 11:34 min.)
Balancing (16mm, silent, color, 20 min.)
Bones (16mm, silent, color, 18 min.)
Choosing to Learn (16mm, sound, color, 26 min.)
Classrooms in Transition (16mm, sound, b&w, 31:15 min.)
Gases and "Airs" in the Classroom (16mm, sound, b&w, 32:20 min.)
Kitchen Physics (16mm, sound, color, 30 min.)
Pond Water (16mm, sound, color—part one: 21 min.; part two: 19 min.)
A Small Things Classroom (16mm, sound, b&w, 25 min.)

d. Supplementary Books ..... **EDC**
The Elementary Science Study—A History
The ESS Reader
An Interview with Dorothy Welch
An Interview with Bruce Whitmore
An Interview with Pat Hourihan
Introduction to the Elementary Science Study
A Materials Book for the Elementary Science Study
A Working Guide to the Elementary Science Study

e. Other ..... **M-HBC**
Introduction to the Elementary Science Study
Weeple People (Grades 3-6)
ESS Evaluation Program (for all units)

11. SCIENCE CURRICULUM IMPROVEMENT STUDY (SCIS). 1962- . **Robert Karplus,** Lawrence Hall of Science, University of California, Berkeley, California 94720.

a. Teacher guides, student manuals and equipment kits ..... **RMC**

[1] Other concerns distributing the films and the film loops are Holt, Rinehart and Winston, Inc. **(HRW)**, Eduquip Macalaster Corporation **(EdMC)**, Modern Learning Aids **(MLA)**, and Universal Education and Visual Arts **(UEVA)**.

Beginnings
Material Objects
Organisms
Interaction and Systems
Life Cycles
Subsystems and Variables
Populations
Relative Position and Motion
Environments
Energy Sources
Communities
Models: Electric and Magnetic Interactions
Ecosystems

Eng-Canada:**WJG**
Eng-Guam:**DEG**
Eng-Pacific Islands:**TTPI**
Da:**MUNKS**
Fr-Canada:**IRP**
Sp:**RMC**
Sw:**SKV**

b. Publications available from the SCIS project:
Evaluation Supplements for all units except *Beginnings*
SCIS Teacher's Handbook
SCIS Omnibus
SCIS Newsletter

c. Teacher training films (16mm, sound) available for purchase from the SCIS project.
Available for rent ..... **EMC**
What Would Happen If. . .? (24 min., color)
Don't Tell Me, I'll Find Out (22 min., color)
How Can We Find Out? (9 min., color)
Around the Corner (10 min., color)
Energy and Models (20 min., color)
Let's Try It (23 min., color)
Experimenting with Air (15 min.)
Observing Liquids (15 min.)
Material Objects Overview (14 min.)
Interaction Documentary (11 min.)
Interaction Overview (11 min.)
Relativity (17 min.)
How Cold is Ice? (10 min.)
Flip Books (12 min.)

12. SCIENCE—A PROCESS APPROACH (SAPA): COMMISSION ON SCIENCE EDUCATION. 1962-1971. **Arthur J. Livermore,** American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington, D.C. 20005.

a. SAPA I ..... **GC**
SAPA I is the original (1967) edition. For Levels A through G (grades K-6) each *Comprehensive Classroom Unit* includes materials for 30 pupils and one teacher text. Materials for use at all levels include:
Commentary for Teachers
Hierarchy Charts:
Basic Skills (K-4)
Integrated Skills (4-6)
In-Service Training includes:
Guide for In-Service Instruction
Response Booklet
Process Measure (pre- and post- tests, 1 per participant)

b. SAPA II ..... **GC**
SAPA II is a major revision of the original program. 105 modules cover grades K-6—15 modules to a grade.
Conversion packages include directions and materials to convert Parts A-G installations, to the SAPA II Module format, Teachers' Instruction Booklets, printed matter, and other materials. Also available are Competency Tracking Cards, a binder holding tracking cards and Instruction Booklets for each grade level, and a Program Guide.

Translations:

Ge:**AUP**
Ko:**SERK**
Sp-Puerto Rico:**CPR**

SAPA has been sold in English in the following countries:

Australia
Colombia
East Africa
Germany
Iran
Israel
Japan
Malaysia
North Africa
Pacific Islands
Pakistan
Panama
Philippines
Puerto Rico
Scotland
Singapore
Spain
Thailand
United Arab Republic
United Kingdom (England)
Yugoslavia

13. ELEMENTARY SCHOOL SCIENCE PROJECT. (ESSP). 1960-1969. **J. Myron Atkin,** Department of Elementary Education, and **Stanley P. Wyatt, Jr.,** Department of Astronomy, University of Illinois, Urbana, Illinois 61801.

Information on materials and their availability is fully covered in NSF E 74-30.

D. Social Sciences

14. ELEMENTARY SCHOOL POLITICAL SCIENCE EDUCATION PROJECT. 1972- . **Richard C. Snyder,** Mershon Center, Ohio State University, Columbus, Ohio 43210. (Grantee: American Political Science Association, 1527 New Hampshire Avenue, N.W., Washington, D.C. 20036.)

Information is available from the project director.

15. **MAN: A COURSE OF STUDY** (MACOS). 1963-1970. **Peter B. Dow,** Education Development Center, Inc., 15 Mifflin Place, Cambridge, Massachusetts 02138. Grantee: Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160.)

a. Student Booklets ..... **CDA**
Life Cycle
Animal Adaptation
Information and Behavior
Innate and Learned Behavior
Natural Selection
Structure and Function
Salmon
Herring Gulls
The Observer's Handbook
Animals of the African Savanna
Baboons
The Baboon Troop
Baboon Communication
The Field Notes of Irven DeVore
A Journey to the Arctic
Songs and Stories of the Netsilik Eskimos
Antler and Fang
The Arctic
On Firm Ice
The Many Lives of Kiviok
This World We Know
The True Play
The Data Book
The Grizzly Bear
The Chimpanzee
The African Elephant
The Gnu
The Bottlenose Porpoise
The Brown Rat
The Wolf
Stalking the Paperclip

b. Teacher Guides ..... **CDA**
Talks to Teachers
A Guide to the Course
Introductory Lessons and Salmon
Herring Gulls
Baboons
The Netsilik Eskimos at the Inland Camps
The Netsilik Eskimos on the Sea Ice
Seminars for Teachers
Evaluation Strategies

c. Films (16mm, color, and Super 8mm optical sound cartridge in color)
The Life Cycle of the Salmon (10 min.) **CDA, UEVA**
Herring Gull Bevavior (10 min.) ... **CDA, UEVA**
Animals in Amboseli (20 min.) .... **CDA, UEVA**
The Younger Infant (10 min.) ..... **CDA, UEVA**
The Older Infant (8 min.) ..... **CDA, UEVA**
The Baboon Troop (22 min.) ..... **CDA, UEVA**
Miss Goodall and the Wild Chimpanzees (29 min., 16mm only) ..... **FI**
Miss Goodall and the Wild Chimpanzees (29 min., Super 8mm only) ..... **CDA**
Fishing at the Stone Weir (30 min.) . **CDA, UEVA**
Life on the Tundra (14 min., 16mm only) ..... **EBEC**
Life on the Tundra (14 min., Super 8mm only) ..... **CDA**
At the Caribou Crossing-Place (29 min.) ..... **CDA, UVEA**
Autum River Camp, Part I (26 min.) **CDA, UEVA**
Autum River Camp, Part II (32 min.) ..... **CDA, UEVA**
Winter Sea-ice Camp, Part I (32 min.) ..... **CDA, UEVA**
Winter Sea-ice Camp, Part III (30 min.) ..... **CDA, UEVA**
The Legend of the Raven (20 min.) ..... **CDA**
Knud (31 min., 16mm only) ..... **M-HBC**
Knud (31 min., Super 8mm only) ..... **CDA**
Netsilik films outside the U.S. ..... **NFB**

d. *Curiosity, Competence, Community,* a report on the research, field-testing and evaluation of the course ..... **CDA**

e. Filmstrips ..... **CDA**
Looking at Animals
Herring Gulls
Baboons
Netsilik Life
Netsilik Today

f. Games ..... **CDA**
Caribou Hunting Game Sheets
Seal Hunt Tally Sheets and Game Board
Caribou Hunting Rules

g. Records ..... CDA
"In the Field" (2-7")
"Words Rise Up" (2-12")

h. Miscellaneous ..... CDA
Eskimo Cards
Netsilik Family Photos
Caribou Game Dice
Seal Meat Stickers
Maps, Posters, and Photomurals

Sold in English in:
Australia
Canada
England
Ireland
New Zealand
Scotland

Overseas American and International Schools:
Australia
Germany
Greece
Hong Kong
Indonesia
Italy
Japan
Laos
Malaysia
Morroco
Singapore
Taiwan
Thailand
Tunisia

II. INTERMEDIATE SCHOOL PROJECTS

A. Mathematics

16. SCHOOL MATHEMATICS STUDY GROUP (SMSG). 1958-1972. **E.G. Begle,** School of Education, Stanford University, Stanford, California 94305. (Original grantee: Yale University, New Haven, Connecticut 06520. 1958-1961.)

See number 76 for project materials.

17. UNIVERSITY OF ILLINOIS COMMITTEE ON SCHOOL MATHEMATICS (UICSM). 1962-1971. **Russell E. Zwoyer,** University of Illinois Committee on School Mathematics, 110J Education, Urbana, Illinois 61801.

a. For Junior High School Underachievers . **HRP**
Stretchers and Shrinkers, 7th Grade
Book 1, The Theory of Stretching Machines
Book 2, Advanced Topics in Stretching and Shrinking
Book 3, The Theory of Fractions
Book 4, Decimals
Activities Handbook for Teachers

Motion Geometry, 8th Grade
Book 1, Slides, Flips and Turns
Book 2, Congruence
Book 3, Symmetry
Book 4, Constructions, Area, and Similarity
Activities Handbook for Teachers
Books 1, 2, 3, and 4 of each course are available in both student and teacher editions.

b. High School Mathematics ..... **DCH**
High School Mathematics
Course 1. (covers elementary algebra, including quadratic equations and simultaneous linear equations)
Teacher's Edition
Overhead Projectuals for Course 1
Teacher's Guide
Course 2. (covers plane, coordinate, and solid geometry)
Teacher's Edition
Overhead Projectuals for Course 2
Course 3. (a second course in algebra)
Teacher's Edition
Course 4. (deals with circular functions, complex numbers, and polynomial functions and extends the work with real numbers from *Course 3)*
Teacher's Supplement
Introduction to Algebra
Teacher's Edition
Overhead Projectual Kit (with teacher guide)

c. Vector Geometry Course ..... **MPC**
Vector Geometry, Vol. 1 (Szabo and Vaughn)
Teacher and student editions
Vector Geometry, Vol. 2 (Szabo and Vaughn)
Teacher and student editions
Fr-Canada:**LEJ**

d. See also project number 18.

18. FILMS FOR TRAINING NINTH GRADE ALGEBRA TEACHERS. 1962-1967. **Max Beberman** (deceased), University of Illinois Committee on School Mathematics, 110J Education, Urbana, Illinois 61801.

a. Films (16mm, b&w except as otherwise noted) MLA (Sequentially Organized Series)

1. *Numbers and Numerals—Part I* (26 min.)
2. *Numbers and Numerals—Part II* (25 min.)
3. *Real Numbers: Developing the Concept* (34 min.)
4. *Adding Real Numbers* (35 min.)
5. *Advent of Awareness* (27 min.)
6. *Multiplying Real Numbers* (37 min.)
7. *Isomorphism: Developing the Concept* (45 min.)
8. *Punctuation and Conventions in Mathematics—Part I. Punctuation* (28 min.)
9. *Punctuation and Conventions in Mathematics—Part II. Conventions* (33 min.)
10. *Operations: Binary, Singulary* (24 min.)
11. *Operation Machines* (24 min.)
12. *Inverses of Operations* (26 min.)
13. *Functions: Foreshadowing the Concept* (31 min.)
14. *Subtracting Real Numbers* (29 min.)
15. *Dividing Real Numbers* (29 min.)
16. *Basic Principles for Real Numbers—Part I. Principles of Arithmetic for Numbers of Arithmetic* (38 min.)
17. *Basic Principles for Real Numbers—Part II. Distributive Principles for Numbers of Arithmetic* (39 min.)
18. *Basic Principles for Real Numbers—Part III. Principles of Arithmetic for Real Numbers* (21 min.)
19. *Basic Principles for Real Numbers—Part IV. Discovery and Patterns* (35 min.)
20. *Comparing Real Numbers: The Number Line* (17 min.)
21. *Prerequisite to Communication* (22 min.)
22. *Numerical Variables: Developing the Concept—Part I* (33 min.)
23. *Numerical Variables: Developing the Concept—Part II* (30 min.)
24. *Bound Variables: Matching Language with Awareness* (40 min.)
25. *Verbalizing Generalizations in the Classroom* (19 min.)
26. *Prelude to Deduction* (29 min.)
27. *Substitution and The Linking Rule* (37 min.)
28. *Prelude to Proof-Making* (39 min.)
29. *Proving Generalizations—Part I. Test Pattern Principle* (32 min.)
30. *Proving Generalizations—Part II. Classroom Examples* (31 min.)
31. *Organizing Knowledge by Deduction* (47 min.)
32. *Principles and Discovery in Algebraic Manipulation—Part I. Equivalent Expressions* (21 min.)
33. *Principles and Discovery in Algebraic Manipulation—Part II. Simplification* (32 min.)
34. *Principles and Discovery in Algebraic Manipulation—Part III. Manipulating Fractions* (40 min.)
35. *Principles and Discovery in Algebraic Manipulation—Part IV. Some Other Common Cases* (29 min.)
36. *Sentences and Solution Sets* (33 min.)
37. *Naming Sets: The Set Abstractor* (33 min.)
38. *Number Line Graphs of Solution Sets* (19 min.)
39. *Solving Equations—Informal Approach* (28 min.)
40. *Logical Basis for Equation Transformation Principles—Part I* (32 min.)
41. *Logical Basis for Equation Transformation Principles—Part II* (31 min.)
42. *Logical Basis for Equation Transformation Principles—Part III* (34 min.)
43. *Subset of a Set: Developing the Concept* (29 min.)
44. *Equivalent Equations: Developing the Concept* (43 min.)
45. *Equivalent Equations and Transformation Principles* (30 min.)
46. *Equation Transformation Principles in Practice—Part I* (29 min.)
47. *Equation Transformation Principles in Practice—Part II* (23 min.)
48. *Transformation Principles for Inequations—Part I* (31 min.)
49. *Transformation Principles for Inequations—Part II* (29 min.)
50. *Solving Worded Problems* (28 min.)

b. Subseries can be selected from the above listing to provide sequences suitable for workshops, institutes, or teachers' seminars of varying lengths. Some such groupings include Equations, Operations with Real Numbers, Deduction in High School Algebra, Inequations in Elementary Algebra, The Relation of Algebra to its Applications, and Unverbalized Awareness and Nonverbal Communication. Further information is available from the project.

19. NINTH GRADE MATHEMATICS COURSE. 1969- . **Russell E. Zwoyer,** University of Illinois Curriculum Laboratory, 1210 West Springfield, Urbana, Illinois 61801.

Commercial distribution arrangements are incomplete. Inquiries should be addressed to the project director.

B. Science

20. OUTDOOR BIOLOGY INSTRUCTIONAL STRATEGIES (OBIS). 1972- . **Watson M. Laetsch,** Lawrence Hall of Science, University of California, Berkeley, California 94720.

OBIS Trial Edition, Set I. . .Available from the project.
(Set I is a packet of 24 OBIS folios, available as a complete packet only.)
Adaptation—Predator-Prey
Animal Movement in Water
Animals in a Grassland
Attention!
Bean Bugs
Great Steamboat Race
Habitat Sun Prints
Habitats of the Pond
How Many Organisms Live Here?
Invent a Plant
Invent an Animal
Mapping a Study Site
Moisture Makers
Natural Recycling in Soil
Natural Recycling in Water
Out of Control
Plant Hunt
Plants Around a Building
Seed Dispersal
Sticklers
Terrestrial Hi-Lo Hunt
Water Holes to Mini-Ponds
What Lives Here?
Who Goes There?
OBIS Lawn Guide
OBIS Pond Guide

Distribution arrangements, now in progress, will be announced when they have been completed. In the meantime, materials are available from the project. Information about materials planned and in developmental stages may be obtained by writing to the project director.

21. HUMAN SCIENCES PROGRAM (HSP). 1971- . **William V. Mayer,** Biological Sciences Curriculum Study, Box 930, Boulder, Colorado 80302. 1972- . (Prior grantee: University of Colorado, Boulder, Colorado 80302. 1971-1972.)

Human Science Program ..... **BSCS**
Human Sciences Sampler
Human Sciences Program, Interim Report
Demonstration Module, Level I, *Behavior*
Demonstration Module, Level II, *Perception*
(Other modules will become available as developmental and trial stages are completed.)

22. ENVIRONMENTAL STUDIES FOR URBAN YOUTH (ES). 1970- . **Richard B. Sluss** and **Robert E. Samples,** The Evergreen State College, Olympia, Washington 98505. (Prior grantee: American Geological Institute, 9205 Leesburg Pike, Falls Church, Virginia 22041.)

a. Packets of environmental studies materials ..... **AWP**
ESSENCE 1 (Grades K-12). 75 assignment cards and 1 teacher's booklet
ESSENCE 2 (Grades K-12). 10 booklets (*Enviros, Creature, Communicate, Evolution, Peephole, Astro/Astro, People Patterns, Community, Movement, Coping with Complexity),* 1 make-your-own game, 1 teacher's booklet.

23. **PROBING THE NATURAL WORLD:** INTERMEDIATE SCIENCE CURRICULUM STUDY (ISCS). 1969- . **George O. Dawson,** Florida State University, Tallahassee, Florida 32306. (Project Headquarters: 415 N. Monroe Street, Tallahassee, Florida 32301.)

a. **PROBING THE NATURAL WORLD ... SBC**
1. Level 1, Volume 1, Grade 7, *Student's Text* (1970)
Teacher's Edition
Student Record Book
Teacher's Edition
Master Set
Section Set
Eng-Canada: **SBC**
Eng-Philippines: **UPQC**
Eng-Independent Schools of the Pacific and of Europe: **SBC**
Eng-USDESEA: **SBC**
2. Level 2, Volume 2, Grade 8, Student's Text (1971) (Types of materials are the same as for Level 1, Volume 1, above.)
3. Level 3, Volume 3, Grade 9 (1972)
Master Set (contains laboratory equipment for all eight Units)
Economy Set (contains laboratory equipment for all eight Units in same room)
Master Common Items Package
Master Unique Items Package
For complete information on laboratory

equipment for Grade 9 write Product Manager, Science, Silver Burdett Company (SBC).

4. Individual Units for Level 3, Volume 3
   (a) IN ORBIT (Astronomy)
   (b) WHAT'S UP? (Space Science)
   (c) INVESTIGATING VARIATION (Human Differences)
   (d) WHY YOU'RE YOU (Genetics)
   (e) CRUSTY PROBLEMS (Geology)
   (f) WINDS AND WEATHER (Meteorology)
   (g) WELL BEING (Health Science)
   (h) ENVIRONMENTAL SCIENCE (Ecology)
   Each unit includes: Student's Text and Teacher's Edition; Student's Record Book and Teacher's Edition; Master Kit: Common Items Package, Unique Items Package

b. ISCS INDIVIDUALIZED TEACHER PREPARATION (ITP) PROGRAM ..... **SBC**

1. ISCS Content Modules
   (a) Level 1, Volume 1, Grade 7
   Operationally Defining Work
   Energy and Systems
   Measuring Electricity
   Heat and Particles
   (b) Level 2, Volume 2, Grade 8
   Developing a Particle Model
   Particles and Life
   Model Testing and Modifying
   (c) Level 3, Volume 3, Grade 9
   Life in the Balance
   Geo-Cycles
   Human Variability
   Probing Space

2. ISCS Teaching Strategy Modules (for use with all three levels)
   Rationale for Individualization
   Classroom Organization
   Questioning
   Questioning Tape Cassette
   Your Student's Role
   Your Student's Role Tape Cassettes
   Evaluating and Reporting Progress
   Individualizing Objective Testing
   Developing Process Skills

3. ISCS Individualized Testing System
   (a) Level 1 Package
   Evaluating and Reporting Progress
   Individualizing Objective Testing
   Performance Objectives
   Performance Checks A, B, C
   Performance Assessment Resource Part I and Part II
   (b) Level 2 Package
   Evaluating and Reporting Progress
   Individualizing Objective Testing
   Performance Objectives
   Performance Checks, A, B, C
   Performance Assessment Resource Part I and Part II
   (c) Level 3 Package
   Evaluating and Reporting Progress
   Individualizing Objective Testing
   Performance Objectives
   Performance Checks A, B, C
   Environmental Science—Well-Being
   Why You're You—Investigating Variation
   In Orbit—What's Up?
   Winds and Weather—Crusty Problems
   Performance Assessment Resource
   Environmental Science—Well-Being
   Why You're You—Investigating Variation
   In Orbit—What's Up?
   Winds and Weather—Crusty Problems

24. **INTRODUCTORY PHYSICAL SCIENCE** (IPS). 1963-1969. **Uri Haber-Schaim,** Physical Science Group, School of Education, Boston University, 765 Commonwealth Avenue, Boston, Massachusetts 02215, (Grantee: Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160.)

a. Printed materials ..... **P-H**
Introductory Physical Science Textbook (Clothbound or paperbound)
Textbook
Teacher Guide
Achievement Test Packages and Answer Sheets
Testing Manual
Eng-Philippines: **UNK**
Fr-Canada: **IRP**
It: **NZEI**
Ja: **ISP**
Ko: **SESC**
Por—Brazil: **FUNBEC, EDART**
Sp-Colombia: **C&C**
Sp-Spain: **ERBS**
Tu: **TCM**

b. Films (16mm, Sound, b&w unless otherwise noted) ..... **MLA**
Behavior of Gases (13 min.)
Crystals (color, 25 min.)
Definite and Multiple Proportions (30 min.)
Elements, Compounds and Mixtures (color, 33 min.)
The Mass of Atoms
Part I (20 min.)
Part II (27 min.)
Sp: **MLA** (films)

c. Demonstration Film Loops ..... **P-H**
(Super 8mm Technicolor Cartridges)
How Does the Thermal Expansion of Liquids Compare?
How Does the Thermal Expansion of Gases Compare?
How Does the Stretch of Wires Compare?
Radioactive Substances I
Radioactive Substances II
Molecular Motion and Diffusion (With Bromine)
The Sphere-Gas Machine (An Analogue)

d. Equipment ..... **P-H, HSC**

25. **PHYSICAL SCIENCE II** (PSII). 1967-1972. **Uri Haber-Schaim,** Physical Science Group, School of Education, Boston University, 765 Commonwealth Avenue, Boston, Massachusetts 02215. (Grantees: Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160, 1967-1971; Newton College, 885 Centre Street, Newton, Massachusetts 02159, 1971-1972.)

a. Printed materials ..... **P-H**
Physical Science II
Textbook
Teacher Guide
Achievement Test Packages and Answer Sheets
Testing Manual
It: **NZEI**
Por-Brazil: **FUNBEC**
Sp-Spain: **ERBS**
Tu-**TCM**

b. Demonstration Film Loops ..... **P-H**
(Super 8mm Technicolor Cartridges)
Motion of Electric Charges Through a Vacuum
How Does the Effusion Time of Gases Compare?
A Gas Analogue
The Distribution of Speeds in a Mixture of Disc Gases

c. Equipment ..... **P-H, HS**

26. **TIME, SPACE, AND MATTER:** Secondary School Science Project (TSM). 1963-1972. **George J. Pallrand,** Science Education Center, Rutgers, The State University, New Brunswick, New Jersey 08903. (Original grantee: Princeton University, Princeton, New Jersey 08540. 1963-1967.)

a. Teacher materials ..... **M-HBC**
Time, Space, and Matter, A Conspectus (an overview of the course) Teacher Folios, to accompany each student investigation.

b. Student materials ..... **M-HBC**
(1) Student Investigation Books:
Encountering the Physical World
Exploring a Slice of the Earth
From Microcosm to Macrocosm
Levels of Approximation
Dimensions and Motions of the Earth
The Surface of the Earth
The Grand Canyon of the Colorado
The Surface of the Moon
Worlds in Space
(2) *Student Record Book* (a journal for the course)

c. Science Reading Series for *Time, Space and Matter* ..... **M-HBC**
First Through the Canyon
The Lunar First
On a Piece of Chalk
Arizona Crater: The Case for Impact
A Strange Crater in Arizona
The Motions of Earth about a Fixed Sun
Watching the Earth Turn
The Forms of Water
The Little Balance
The Moon's Face
Earth: Center of a Round Universe
Solar Eclipses: A Sight to See
When the Earth Trembles
How Big Is It?
No Beginning and No End
The Earth Bombarded
Story of Project Apollo
Volcanoes
The Age of the Earth
Huge Distances, Tiny Measurements
The World of Ice
Back Into Time

d. Equipment ..... **M-HBC**
Student Equipment Package
Teacher Equipment Package
Classroom Equipment Package

27. **INVESTIGATING THE EARTH:** EARTH SCIENCE CURRICULUM PROJECT (ESCP). 1963-1973. **William D. Romey,** P.O. Box 1559, Boulder, Colorado 80302. (Grantee: American Geological Institute, 9205 Leesburg Pike, Falls Church, Virginia 22041.)

a. *Investigating the Earth, Revised Edition* ..... **HMC**
Teacher's Guide
Laboratory Supplement
Progress Tests
AGI/ESCP approved laboratory equipment
Ko: **SNU**
Por-Brazil: **FUNBEC**
Sp-Central and South America: **C&C**

b. *ESCP Reference Series* ..... **AGI**
RS-1 *Sources of Earth Science Information*
RS-2 *Selected References for Earch Science Courses*
RS-3 *Selected Earth Science Films*
RS-4 *Selected Maps and Earth Science Publications of the States and Provinces of North America*
RS-5 *Free Materials for Earth Science Teachers*
RS-6 *Planetariums, Observatories, and Earth Science Exhibits*
RS-7 *Topographic Maps—Their Use and Interpretation*
RS-8 *Guide to Geological Field Trip Guidebooks for North America*
RS-9 *Basic Data and the Water Budget Computation for Selected Cities in North America, 1967*

c. Films (16mm, b&w, except as noted, sound) ..... **EBEC**
Toward Inquiry—Teaching Earth Science (21 min.)
How Solid is Rock? (22 min.)
Reflections on Time (22 min.)

d. Single-topic field study guides ..... **HMC**
PS-1 Field Guide to Rock Weathering
PS-2 Field Guide to Soils
PS-3 Field Guide to Layered Rocks

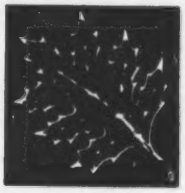
PS-4 Field Guide to Fossils
PS-5 Field Guide to Plutonic and Metamorphic Rocks
PS-6 Color of Minerals
PS-7 Field Guide to Beaches
PS-8 Field Guide to Lakes
PS-9 Field Guide to Astronomy Without a Telescope
PS-10 Meteorites

III. SECONDARY SCHOOL PROJECTS

A. Astronomy

28. ASTRONOMICAL MOTION PICTURES FOR SECONDARY SCHOOLS AND COLLEGES. 1964-1968. **Paul M. Routly,** American Astronomical Society, 211 Fitz-Randolph Road, Princeton, New Jersey 08540.

Information on materials and their availability is fully covered in NSF E 74-30.



B. Biology

29. BIOLOGICAL SCIENCES CURRICULUM STUDY (BSCS). 1959-1971. **William V. Mayer,** Biological Sciences Curriculum Study Company, P.O. Box 930, Boulder, Colorado 80302. (Original grantees: American Institute of Biological Sciences, 3900 Wisconsin Avenue, N.W., Washington, D.C. 20016. 1959-1962; University of Colorado, Boulder, Colorado 80302, 1962-1971.)

a. Introductory Biology Courses
   (1) Blue Version—*Biological Science: Molecules to Man,* Third Edition. Text includes sixty-two laboratory studies ..... **HMC**
   Teacher's Guide ..... **HMC**
   Test Item Book ..... **BSCS**
   Revised Edition
   Third Edition

(2) Green Version—*Biological Science: An Ecological Approach*, Third Edition. The text includes laboratory investigations ..... **RMC**
Teacher's Edition ..... **RMC**
Test Item Book ..... **BSCS**
Second Edition
Third Edition

(3) Yellow Version—*Biological Science: An Inquiry Into Life*, Third Edition, 1973. Laboratory investigations are built interdependently into the text ..... **HBJ**
Teacher's Manual (1973) ..... **HBJ**
Test Item Book ..... **NBJ**
Second Edition

Ch-Hong Kong: **CUHK** (yellow)
Ch-Taiwan: **RCT** (yellow)
Da: **GBNF:** (blue)
Du: **S/R** (green)
Eng-Australia: **AAG** (green)
Eng-England: **UK** (green)
Eng-Great Britain: **JM** (green)
Eng-Hong Kong: **OxUP** (yellow)
Eng-India: **NCERT** (yellow)
Eng-India: **UGCI** (yellow)
Eng-New Zealand: **NZ/DE** (blue, green, yellow)
Eng-Pakistan: **PTB** (yellow)
Eng-Philippines: **P** (green)
Eng-Singapore: **STAS** (blue, green, yellow)
Fr-Canada: **CdPdP** (blue)
Fr-Canada: **LELI** (blue)
He-Israel: **MEC** (yellow)
In: **UNK** (green)
It: **NZEI** (blue), F (yellow)
Ja: **ICU** (blue, green, yellow)
Ko: **UNK** (green)
Pe-Afghanistan: **FBP** (green)
Por-Brazil: **EDART** (green)
Por-Brazil: **EUB** (blue)
Ru: **UNK** (blue, green)
Sl: **DZS** (blue)
Sp-Argentina: **EE** (green)
Sp-Colombia: **C&C** (green)
Sp-Mexico: **EC** (yellow)
Sp-Spain: **ER** (blue)
Sp-Temperate South America: **UNdT** (green)
Sp-Tropical South America: **UdV** (green)
Sp-Venezuela: **EC** (blue)
Ta-Philippines: **UPQC** (green)
Th: **UNK** (yellow)
Tu: **UA** (blue)
Vi: **UNK** (blue, green, yellow)

b. Special Materials
Biological Science: Patterns and Processes (for less able students) ..... **HRW**
Teacher's Handbook ..... **HRW**
Test Item Book ..... **BSCS**
Second Edition
He-Israel: **MEC**
Ja: **ICU**
Sp-Mexico: **ET**

c. Special Course
Biological Science: Interaction of Experiments and Ideas, Second Edition, (1971-
Teacher's Manual ..... **P-H**
Second Edition (1971)
Examinations ..... **BSCS**
He-Israel: **MEC**
Ja: **ICU**
Sp-Mexico: **ELW**
Tu: **UA**

d. College Biology
The Collegiate Minicourse Program (in preparation) ..... **BSCS**
Tentative Clusters include:
Biological Structure and Function, Reproduction, Genetics, Life's Energy, et al. About 75 to 100 minicourses will be produced.

e. For School or College
(1) *Research Problems in Biology: Investigations for Students*, Series 1, 2, and 3—Second Edition. (Publisher and release dates to be announced in forthcoming issues of the BSCS *Newsletter.)*
Ja: **ICU**
Sp-Mexico: **ELW**

(2) *Environmental Module: Investigating Your Environment* ..... **AWP**
With Teacher's Handbook
Student's Handbook
Student Resource Library

f. Audio-Visual Programs
(1) Single Topic Inquiry Films—Super-8mm available for both the Technicolor 810 Super-8 Cartridge projector and the Kodak Ektagraphic projector.
For Teacher Preparation, each with teacher's guide .... **HBJ, HMC, RMC**
For Student Self-Instruction, each with self-instruction guide ..... **HSC**
Single Topic Inquiry Film Titles:

An Example of the Biological Significance of Color
An Inquiry—The Importance of the Nucleus
Australian Marsupials
Behavior of a Purple Bacterium
Chemical Communication
Convergence
Englemann's Inquiry into Photosynthesis
Feeding Behavior of Hydra
Feeding Mechansims of Oyster Drills
Flowering
Fossil Interpretation
Frog Development
Gene Flow in a California Salamander
Genetic of Bacterial Nutrition
Grouse—A Species Problem
Imprinting
Life in the Intertidal Region
Locomotion in an Amoeba
Mating Behavior in the Cockroach
Mimicry
Mitosis
Mountain Trees—An Ecological Study

Nerves and Heartbeat Rate
Oak Populations
Photoreception and Flowering
Phototropism
Planarian Behavior
Prairies and Deciduous Forests
Predation and Protection in The Ocean
Prey Detection in the Rattlesnake
Regeneration in Acetabularia
Social Behavior in Chickens
Structure, Function, and Feeding Behavior in Herons
Temperature and Activity in Reptiles
Temporal Patterns of Animal Activity
The Intertidal Region
The Kidney and Homeostasis
The Peppered Moth: A Population Study
Water and Desert Animals
Water and Desert Plants

(2) The BSCS Inquiry Program: Slide System (35mm slides)—packaged as individual sequences and also in separate trays for use with a Kodak Carousel projector. with Teacher's Guide ..... **HBJ**
Sequences of Inquiry Slides:
Accuracy in Measurement
Cardiac Circulation
Control of Blood Sugar: A Homeostatic Mechanism
Control of Molting in Insects
Control of the Pancreas
Control of Thyroid Secretion
Dietary Deficiency in Chickens
Effects of Thyroid Action
Endocrine Pathways
Genetic Resistance of Pesticides
Light and Plant Growth
Light Intensity and Photosynthesis
Metamorphosis in Cecropia Moths
Paper Chromotography
Plant-Animal Physiology
Quantitative Relationships
Sensing Mechanisms and Homeostasis
Sources of Plant Nutrition
Structure and Function
The Cell Nucleus
He-Israel: **MEC**

(3) Issue-Oriented Inquiry Films ..... **BFA**
The Tragedy of the Commons (16mm, color sound, 23 min., with instructional guide)
Interview with Garrett Hardin (16mm, color, sound, 11 min.)
Energy to Burn, with instructional guide (16mm, color sound, 20 min.)

(4) A Special Inquiry Film ..... **BFA**
Elephant Seals, with instructional guide (16mm, color, sound, 9 min.)

(5) Biology in Three Dimensions (in preparation) ..... **HSC**
Activities for Student Self-instruction Using Stereo Pictures

(6) *Science and Mankind: The Social Implications of Scientific Theory and Discovery*—A series of sound-slide programs ..... **SAM**
(Each program includes two cartridges containing 80 full-color slides each, two tape cassettes and two LP records of the synchronized sound track, and comprehensive User's Guide.)
An Inquiry Into the Origin of Man: Science and Religion
The New Genetics: Rights and Responsibilities

g. Audio-Visual Programs and a Functioning Torso Model
(The four sets of materials that follow are coordinated for use in special classes or regular classes)

(1) *The BSCS Observation Film Loops—Systems of the Human Body* (A series of seven Super-8mm Technicolor or Kodak film loops and accompanying guides) ..... **HSC**
The Heart and Circulation
Lung Action and Function
Liquid Waste and The Kidney
Passage of Food Through the Digestive Tract
Respiration and Waste
Skeletal and Muscle Action
Fertilization

(2) *Environmental Orchestra* (A tape cassette and accompanying guide for eight unseen environmental locations, to focus upon development of hearing as a more reliable sense for observation of the environment) ..... **HSC**

(3) *Observation Filmstrips* (A series of three filmstrips and accompanying guides to enhance the student's ability to describe and to observe his environment) ..... **HSC**
ZOOM IN ..... ZOOM OUT (Silent)
SOME HOUSES ..... (Silent)
SOME SOUNDS ..... (With tape cassette)

(4) *The Functioning Torso* (A model incorporating five "working systems"—Sensory, Breathing, Digestive, Urinary, and Circulatory—which can be manipulated to illustrate how they function) ..... **HSC**

h. Behavior films (A series of five 16mm color sound films) ..... **BFA**
Observing Behavior
Parents—Who Needs Them?
What's Mine is Mine
Language Without Words
A Member of Society

i. Special Education Programs ..... **HSC**
Two programs funded by the Bureau of Education for the Handicapped, U.S. Office of Education, Department of Health, Education, and Welfare. *Life Sciences for the Educable Mentally Handicapped.*

ME NOW is commercially available. Units I, II, and III of the ME AND MY ENVIRONMENT program are currently available, and Units IV, V, and VI, presently in development, depending on continued funding, will be released in 1975 and 1976.

(1) ME NOW
Unit I *Digestion and Circulation*
Unit II *Respiration and Body Wastes*
Unit III *Movement, Support and Sensory Perception*

Unit IV *Growth and Development*

(2) ME AND MY ENVIRONMENT
Unit I *Exploring My Environment*
Unit II *Me as an Environment*
Unit III *Energy Relationships in My Environment*
Unit IV *Transfer and Cycling of Materials in My Environment*
Unit V *Air and Water in My Environment*
Unit VI *Populations and Society*

j. Human Sciences Program ..... **BSCS**
An experimental program in process of development and testing with NSF support, when completed in 1976 will consist of five modules for each of three age groups: eleven-, twelve-, and thirteen-year-olds. Single copies of a descriptive pamphlet, *HUMAN SCIENCES: A Developmental Approach to Adolescent Education*, are available upon request.

First-year materials will not be available commercially until 1975 or 1976. A demonstration module, BEHAVIOR, is now available. This module includes all the instructional materials for six to eight weeks of class time: A Teacher's Guide, student booklets for 28 activities, two audio-tape cassettes, one carousel slide and audio-tape cassettes, one carousel slide and audio-cassette presentation, one Super-8mm film loop, black and white photographs, and student data sheets.

k. Elementary Science Program ... **JBL** or **BSCS**
The BSCS Elementary School Science Program will consist of a series of learning modules for use from kindergarten through the sixth grade. Developers are concerned with production of low-cost materials for elementary teachers whose background is not primarily science. The program for grades 4-6 will be available in the fall of 1975, with the K-3 package becoming available in the fall of 1978. The progress of the project will be reported in the *BSCS Newsletter*.

l. Laboratory Blocks
Animal Behavior (Follansbee) ..... **DCH**
Teacher's Supplement ..... **DCH**
Animal Growth and Development (Moog) ... **DCH**
Teacher's Supplement ..... **DCH**
Evolution (Webb) ..... **DCH**
Teacher's Supplement ..... **DCH**
Field Ecology (Phillips) ..... **DCH**
Teacher's Supplement ..... **DCH**
Genetic Continuity (Glass) ..... **DCH**
Teacher's Supplement ..... **DCH**
Life in the Soil (Pramer) ..... **DCH**
Teacher's Supplement ..... **DCH**
Microbes: Their Growth, Nutrition and Interaction (Sussman) ..... **DCH**
Teacher's Supplement ..... **DCH**
Physiological Adaptation (Segal, Gross) .... **DCH**
Teacher's Supplement ..... **DCH**
Plant Growth and Development (Lee) ..... **DCH**
Teacher's Supplement ..... **DCH**
The Complementarity of Structure and Function (Richards) ..... **DCH**
Teacher's Supplement ..... **DCH**
Regulation in Plants by Hormones—A Study in Experimental Design (Jacobs, La Motte) ... **DCH**
Teacher's Supplement ..... **DCH**
The Molecular Basis of Metabolism (Albersheim, Dowling, Hopkins) ..... **DCH**
Teacher's Supplement ..... **DCH**
Innovations in Equipment and Techniques for the Biology Teaching Laboratory (Barthelemy, Dawson, Lee) (for teachers) ..... **DCH**
Testing and Evaluating Student Success with Laboratory Blocks (Lee) (for teachers) ..... **DCH**
Radiation and its Use in Biology (Mayer)
Teacher's Supplement ..... **BSCS**
Student Booklet ..... **BSCS**

m. Self-Instructional Program
BSCS Self-Instructional Program—Population Genetics, A programmed unit for individualized instructions ..... **SBC**
Sp-Mexico: **EC**

n. Pamphlet Series ..... **BSCS**
Animal Language (Collias)
Bioelectricity (Suckling)
Biogeography (Neill)
Biological Clocks (Brown)
Biology of Coral Atolls (Boolootian)
Biology of Termites (Miller)
Biomechanics of the Body (Du Brul)
Blood Cell Physiology (Gordon)
Cell Division (Mazia)
Cellulose in Animal Nutrition (Hungate)
Courtship in Animals (Meyerriecks)
Early Evolution of Life (Young, Ponnamperuma)
Ecology of the African Elephant (Quick)
Growth and Age (Milne, Milne)
Guideposts of Animal Navigation (Carr)
Hibernation (Mayer)
Homeostatic Regulation (Overmire)
Metabolites of the Sea (Nigrelli)
Photoperiodism in Animals (Farner)
Photosynthesis (Gaffron)
Plant Systematics (Raven, Mertens)
Population Genetics (Wallace)
Present Problems about the Past (Auffenberg)
Slime Molds and Research (Alexopoulos, Koevenig)
Sp-Mexico: **EC**

o. Patterns of Life Series ..... **BSCS**
Animals of the Islands(McCoy)
Antibiotics (Perlman)
Biological Effects of Radiation (Shields)
Dynamic Equilibrium (Beidleman)
Ecology of Intertidal Zones (Reid)
Energy Transfer in Ecological Systems (Wiegert)
The Impact of Fungi on Man (Taber, Taber)
Ionizing Radiation and Life (Overmire)
Man's Dependence on Microorganisms (Barrett)
Plant Pigments (Stegner)
A Pleistocene Ecosystem (Gordon)
Population Dynamics (Cairns)
Singing Insects (Alexander)
Tortoise Behavior and Survival (Auffenberg)

p. Science and Society Series ..... **BMC**
(for the student and the informed general reader)
Birth Control (Hardin)
Cancer: The Misguided Cell (Prescott)
Evolution for Everyone (Gastonguay)
Human Heredity and Birth Defects (Volpe)
Man and Birds: Evolution and Behavior (Meyerriecks)
Population Ecology (Quick)
Reptiles and Amphibians in the Service of Man (Neill)
Science, The Brain, and Our Future (Klemm)
Sex and the Single Cell (Keller)
Use and Misuse of Drugs Subject to Abuse (Weinswig)

q. Topics in Biological Sciences Series .... **BMC**
Symbiosis (Cheng)
Hormones: A Delicate Balance (LeBaron)
Metabolism (Olsen)

r. Materials for Teachers
(1) *Biology Teacher's Handbook* (A Resource for the teacher of any biology course) ..... **JWS**
Du: **UdNB**
It: **NZEI**
Por-Portugal: **GF**
Por-Brazil: **FUNBEC**
Sp-Colombia: **UNK**
Sp-Tropical South America: **UdV**
(2) Bulletin Series ..... **BSCS**
(For teachers and those engaged in the preparation of teachers)
Biological Education in American Secondary Schools 1890-1960 (Hurd)
Teaching High School Biology: A Guide to Working With Potential Biologists (Brandwein, Metzner, Morholt, Roe, Rosen)
BSCS Biology—Implementation in the Schools (Grobman, Hurd, Kline, Lawler, Palmer)
The Changing Classroom: The Role of the Biological Sciences Curriculum Study (Grobman)
(3) BSCS Single Topic Inquiry Film Presentation ..... **BSCS**
(4) BSCS Special Publications ..... **BSCS**
BSCS Biology Guidelines for Preparation of In-Service Teachers (out of print)
Patterns for the Preparation of BSCS Biology Teachers (out of print)
BSCS Materials for Preparation of In-service Teachers of Biology (out of print)
The Teacher and BSCS Special Materials (Out of print)
Laboratory Blocks in Teaching Biology
New Materials and Techniques in the Preparation of High School Biology Teachers
Life Sciences in the Middle Schools
Human Sciences: A Developmental Approach to Adolescent Education
(5) *BSCS International News Notes* (an informational series distributed abroad) ..... **BSCS**
(6) *BSCS Newsletter* (a quarterly journal providing specific updated information on BSCS and its programs) ..... **BSCS**

s. Equipment and Supplies for BSCS Programs
The BSCS has selected the R.F. Carle Company, Inc., P.O. Box 1010, Chico, California 95926, as its official supplier of equipment and materials for the following programs:
Biological Science: Molecules to Man
Biological Science: An Ecological Approach
Biological Science: An Inquiry into Life
Biological Science: Patterns and Processes
Biological Science: Interaction of experiments and Ideas
The Laboratory Blocks

t. Innovations in Equipment and Techniques
Sp-Mexico: **TICSA**

u. BSCS "Techniques Films"
Sp: **IFB**

v. Materials for use in teaching biology, based in part or entirely from BSCS materials
Eng-Ceylon: **CAAS**

w. BSCS British Newsletter 2
Eng-England: **UK**

30. FOUR MOTION PICTURES IN SOCIAL BIOLOGY. 1971- . **L. Eugene Cronin** and **Edward J. Kormondy** (Evergreen State College, Olympia, Washington 98505), University of Maryland, College Park, Maryland 20742.

Films, guides and filmstrips (16mm, color) ..... *
Technological Man (28 min.)
Death—An Invention of Life (28 min.)
The World Without—The World Within. Part I. The Animal World View (33 min.)
The World Without—The World Within. Part II. Man—The Symbol-Maker (31 min.)

A teacher guide accompanies each film. Filmstrips are available in sound and captioned versions.

* Inquiries should be addressed to Edward J. Kormondy, Evergreen State College, Olympia, Washington 98505.

31. ECOLOGICAL FILM PROJECT. 1970-1973. **John J. Lee** and **Martin Sacks,** Department of Biology, The City College of the University of New York, Convent Avenue at 138th Street, New York, N.Y. 10031.

Information on materials and their availability is fully covered in NSF E 74-30.

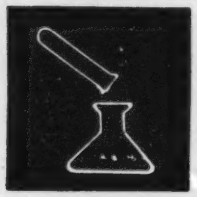
32. LIVING BIOLOGY FILM SERIES. 1960-1971. **John J. Lee** and **Martin Sacks,** Department of Biology, The City College of the University of New York, Convent Avenue at 138th Street, New York, New York 10031. (Original grantee: Yeshiva University, 55 Fifth Avenue, New York, New York 10003; former director, Roman Vishniac (deceased), 1960-1969).

Information on materials and their availability is fully covered in NSF E 74-30.

33. FILMS ON THE NATURE OF VIRUSES. 1959-1961. **Wendell M. Stanley** (deceased), Virus Laboratory, University of California, Berkeley, California 94720.

a. Films (16mm films, sound, black-and-white, 29 min. each) for purchase or rental .. **AVC-Ind.**
Between the Living and the Non-living (Stanley)
Giant Molecules (Williams)
The Stuff of Life (Knight)
Viral Genes (Stent)
Threads of Life (Fraenkel-Conrat)
Killers and Carcinogens (Rubin)
Cancer (Stanley)

b. Text based on the film series ..... **EPD**
Viruses and the Nature of Life (Stanley and Valens) (1961)



C. Chemistry

34. CHEMICAL EDUCATION MATERIAL STUDY (CHEM Study). 1959-1969. **George C. Pimentel,** Department of Chemistry, University of California, Berkeley, California 94720. (Original grantee: Ohio State University, Columbus, Ohio 43210. 1959-1960.)

a. Basic course materials ..... **WHF**
(1) *Chemistry—An Experimental Science* (1963) (20th printing 1974)
Text
Laboratory Manual
Teacher's Guide
Ch: **RCT**
Eng-Ind: **NCERT**
Fr-Ca: **LELI, CdPdP**
Fr-Fr: **DE**
Gu: **NCERT**
He: **WIS**
Hi: **MPVRA**
Ic: **AB**
It: **LP**
Ja: **KYS**
Ko: **TDP**
Pe: **FBP**
Por-Br: **FUNBEC**
Por-Por: **GF**
Pu: **PU**
Ru: **PTBA**
Sp-Co: **EN-MC**
Sp-Sp: **ERBS**
Th: **SST**
Tu: **MECISE**
(2) CHEM Study Achievement Examination
(3) Programmed Instruction Pamphlets
Exponential Notation
The Slide Rule

b. Two monographs ..... **P-H**
Man-Made Transuranium Elements (Seaborg)
Why Do Chemical Reactions Occur? (Campbell)

c. CHEM Study films are available for sale from Modern Learning Aids **(MLA);** for rental from Modern Film Rentals **(MFR).** A teacher guide for each film is available from **MLA.**
(1) Classroom films, 16mm, sound, color except as noted.
A Research Problem: Inert (?) Gas Compounds (19 min.) (Pimentel, Turner)
Acid-Base Indicators (19 min.) (Campbell)
Biochemistry and Molecular Structure (22 min.) (Rounds)
Bromine—Element from the Sea (22 min.) (Hollenberg, Magner)
Catalysis (17 min.) (Powell)
Chemical Bonding (16 min.) (Pimentel)
Chemical Families (22 min.) (Hollenberg, Campbell)
Crystals and Their Structures (b&w, 22 min.) (Campbell)
Electric Interactions in Chemistry (21 min.) (Hollenberg, Campbell)
Electrochemical Cells (22 min.) (Campbell, Ewing)
Equilibrium (24 min.) (Pimentel)
Gas Pressure and Molecular Collisions (b&w, 21 min.) (Campbell)
Gases and How They Combine (22 min.) (Pimentel)
High Temperature Research (19 min.) (Gilles)
The Hydrogen Atom—As Viewed by Quantum Mechanics (standard version) (13 min.) (Pimentel)
The Hydrogen Atom—as Viewed by Quantum Mechanics (advanced version) (20 min.) (Pimentel)
Introduction to Reaction Kinetics (13 min.) (Eyring)
Ionization Energy (22 min.) (Mahan)
Mechanism of an Organic Reaction (20 min.) (Rapoport)
Molecular Motions (13 min.) (Campbell)
Molecular Spectroscopy (23 min.) (Crawford, Overend)
Nitric Acid (18 min.) (Sisler)

Shapes and Polarities of Molecules (18 min.) (Dows)
Synthesis of an Organic Compound (22 min.) (Geissman)
Transuranium Elements (23 min.) (Seaborg)
Vanadium—A Transition Element (22 min.) (Brasted)
Vibration of Molecules (12 min.) (Pauling, Badger

Da: **MLA**
Eng-Ind: **NEIF** (b&w)
Fr-Ca: **MLA & MFR**
Fr-Fr: **MLA**
Ge: **IFDW, MLA**
Gr: **EPIC**
It: **ESI**
Sp:**MLA**
Sw: **MLA**

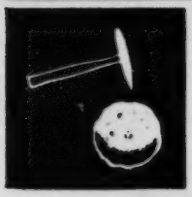
(2) Informational films, 16mm, sound, color
A Chance to Wonder Why (14 min.) (Lynch)
CHEM Study: Information for Educators (19 min.)

(3) Teacher training series, 16mm, sound, black and white
Teacher Training Introduction to "Gases and How They Combine" (12 min.)
Teacher Training Introduction to "Chemical Families" (7 min.)
Teacher Training Introduction to "Reaction Kinetics" (16 min.)
Teacher Training Introduction to "Catalysis" (13 min.)
Teacher Training Introduction to "Equilibrium" (7min.)
Teacher Training Introduction to "Electrochemical Cells" (8 min.)
Teacher Training Introduction to "The Hydrogen Atom—as Viewed by Quantum Mechanics" (9 min.)
Pimentel Discusses the Hydrogen Atom (32 min.)
A Panel Feedback Session (29 min.)
Teacher Training Introduction to "Ionization Energy" (8 min.)
Teacher Training Introduction to "Chemical Bonding" (14 min.)
Pimentel Discusses Chemical Bonding (29 min.)
Teacher Training Introduction to "Crystals and Their Structures" (7 min.)
Teacher Training Introduction to "Vanadium—A Transition Element" (9 min.)
Teacher Training Introduction to "Mechanism of an Organic Reaction" (7 min.)
Teacher Training Introduction to "Biochemistry and Molecular Structure" (7 min.)
A Discussion Among Teachers and the CHEM Study Staff--Concluding Panel Session (29 min.)

(4) Film Loops—each 4 minutes in length—not available for rental
Absolute Zero
Acid-Base Indicators
Alkali Metal Reactions with Chlorine and with Water
Atomic Hydrogen
Bromine Reactions With Red Phosphorus, Hydrogen and Aluminum
A Copper-Silver Electrochemical Cell
Crystals and X-ray Diffraction
An Electrochemical Cell (animated mechanism)
Gas Pressure
HCl in Water and in Benzene
Ion Exchange
Ionization Energy of Sodium
Mass Spectrometry of TiS
Migration of Ions
Molecular Motion in Condensed Phases
Molecular Structure Determines the Properties of Substances
Molecular Vibrations (using models)
An Organic Mechanism
Paper Chromotography of DNA
Polar and Non-Polar Molecules
A Problem in Diffraction
A Silver-Hydrogen Electrochemical Cell

35. CHEMICAL BOND APPROACH PROJECT (CBA). 1958-1968. **Laurence E. Strong,** Department of Chemistry, Earlham College, Richmond, Indiana 47274.

Information on materials and their availability is fully covered in NSF E 74-30.



D. Environmental Sciences

Meteorology

36. STUDY GUIDE ON PROBLEMS OF AIR POLLUTION. 1970-1972. **Robert G. Nurnberger,** State University of New York, Albany, N.Y. 12222.

Information on materials and their availability is fully covered in NSF E 74-30.

37. MOTION PICTURES IN METEOROLOGY. 1960-1971. **Kenneth C. Spengler,** American Meteorological Society, 45 Beacon Street, Boston, Massachusetts 02108.

a. Films, 16mm, color, sound, unless otherwise noted ..... **MLA, UEVA**
A teacher guide accompanies each film.
Atmospheric Electricity (26 min.)
Convective Clouds (27 min.)
Formation of Raindrops (26 min.)
Planetary Circulation of the Atmosphere (25 min.; b&w)
Sea Surface Meteorology (26 min.; b&w)
Solar Radiation I: Sun and Earth (18 min.)
Solar Radiation II: The Earth's Atmosphere (24 min.)
Ills and Ill Wind (15 min.)
Wind Chill (17 min.)
Eng-Outside the United States: **MLA**

Above the Horizon (21 min.)
Du,Fi,Ge,It,Ja,No,Por,Sp: **NFB**
Eng-United States: **MLA, UEVA**
Eng-Worldwide, except the United States: **NFB**
(**NFB** subcontracts provide commercial foreign distribution for theatrical use, sales, and television in more than 50 foreign countries and provinces.)
Information on Super 8 film loops available in the above titles can be obtained by writing to the distributors.

b. Additional Super 8 Film Loops ..... **MLA**
A teacher guide accompanies each film.
Laboratory Nucleation of Supercooled Clouds (4 min.; b&w)
Homogenous Nucleation and the Polar Nature of Ice Crystals (4 min.; b&w)
Condensation Nuclei (4 min.; color)

38. MONOGRAPH SERIES IN METEOROLOGY. 1960-1970. **Kenneth C. Spengler,** American Meteorological Society, 45 Beacon Street, Boston, Massachusetts 03018.

a. Popular monographs ..... **AB-DC**
Cloud Physics and Cloud Seeding (Battan)
The Edge of Space (Craig)
From Raindrops to Volcanoes (Blanchard)
Harvesting the Clouds (Battan)
Jet Streams (Reiter)
The Nature of Violent Storms (Battan)
The Unclean Sky (Battan)
Watching for the Wind (Edinger)
Weather and Health (Landsberg)
Weather on the Planets (Ohring)

Af: **T-U**
Bu: **USIA**
Fi: **WSOY**
Fr-France: **DE**
It: **NZEI**
Po: **PWN**
Por: **USIA**
Por-Brazil: **IBE**
Sp-Argentina: **EUDBA**
Ja: **KSS**

See also Science Study Series ..... **AB-DC**
(Listed under project 53)

Oceanography

39. COLUMBIA-LAMONT MARINE SCIENCE FILMS. 1963-1968. **Maurice Ewing** (deceased), Lamont-Doherty Geological Observatory, Columbia University, Palisades, New York 10964.

Information on materials and their availability is fully covered in NSF E 74-30.

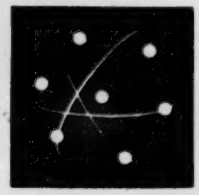
40. OCEANOGRAPHY—EIGHT NARRATED FILMSTRIPS. 1962-1966. **Richard C. Vetter,** Ocean Affairs Board, National Academy of Sciences—National Research Council, 2101 Constitution Ave., N.W., Washington, D.C. 20418.

Information on materials and their availability is fully covered in NSF E 74-30.

Environmental Experiments

41. ENVIRONMENTAL EXPERIMENTS PROGRAM (EEP). 1971-1973. **Courtland S. Randall,** Oak Ridge Associated Universities, Inc., P.O. Box 117, Oak Ridge, Tennessee 37830.

Information on materials and their availability is fully covered in NSF E 74-30.



E. Interdisciplinary

42. INDIVIDUALIZED SCIENCE INSTRUCTIONAL SYSTEM (ISIS). 1972- . **Ernest Burkman,** Florida State University, Tallahassee, Florida 32306. (Project Headquarters: 415 N. Monroe Street, Tallahassee, Flordia 32301.)

Interdisciplinary minicourses ..... GC

Available for use, Fall 1975: *House Power*
Heart Attack

Available for use, Winter 1976: A Total of 15 minicourses.

Available for use in two years: A total of 30 minicourses.

43. PORTLAND INTERDISCIPLINARY SCIENCE PROJECT. 1969-1971. **Karl Dittmer,** College of Science, Portland State University, Portland. Oregon 97207.

Current Contact. Michael Fiasca, School of Education/TTT, Portland State University, P.O. Box 751, Portland, Oregon 97207.

Information on materials and their availability is fully covered in NSF E 74-30.

44. BIOMEDICAL INTERDISCIPLINARY CURRICULUM PROJECT (BICP). 1968- **Leonard A. Hughes,** California Committee on Regional Medical Programs, Box 4445, Berkeley, California 94704. (Prior grantees: University of California at Berkeley and Davis, respectively)

Unit Titles and Course Content:

Biomedical Science

11th Grade:
I. *Respiration in Health and Medicine*
II. *Nutrition in Health and Medicine*
III. *Sensory Systems*

12th Grade:
IV. 1. *The Central Nervous System*
2. *Pharmacology*
V. *The Transport System*
VI. *Trauma and the Musculoskeletal System*
VII. *Reproduction and Genetics*
VIII. *Energy and Cell Dynamics*

Biomedical Mathematics

11th Grade:
I. *Respiration in Health and Medicine*
II. *Nutrition in Health and Medicine*
III. *Sensory Systems*

12th Grade:
IV. *Symbolic Logic and Chi Square*
V. *Theoretical and Applied Quadratics*
VI. *Introduction to Differential Calculus*
VII. *The Binomial Theorem and Genetics*
VIII. *Exponents and Logarithms*

Biomedical Social Science

11th Grade:
I. *Investigation in the Social Sciences*
II. *Culture and Environment: Preindustrial Cultures*
III. *Introduction to American Society*

12th Grade:
IV. *What Affects Human Behavior?*
V. *Allocation of Health Care Resources*
VI. *Intellectual Development*

VII. *Population Growth and Genetics*
VIII. *The Future of Health Care Delivery*

Materials are in developmental and trial stages, and arrangements for commercial publication are not yet completed. Inquiries should be addressed to the project director.

45. "HORIZONS OF SCIENCE" FILMS. 1959-1960. **John S. Hollister,** Educational Testing Service, Princeton, New Jersey 08540.

Information on materials and their availability is fully covered in NSF E-74-30.

46. SCHOOL MATHEMATICS STUDY GROUP (SMSG). 1958-1972. **E. G. Begle,** School of Education, Stanford University, Stanford, California 94305. (Original grantee: Yale University, New Haven, Connecticut 06520. 1958-1961.)

See number 76 for project materials.

F. Mathematics, Computers

47. SOURCE BOOK ON APPLICATIONS OF MATHEMATICS. 1974- . **Alex Rosenberg,** Cornell University, Ithaca, New York 14850. (Grantee: Mathematical Association of America, 1225 Connecticut Avenue, N.W., Washington, D.C. 20036.)

Questions about materials in developmental, or trial, stages should be addressed to the project director. Announcement of availability will be made when distribution arrangements have been completed.

48. DEVELOPMENT OF COMPUTER SIMULATION MATERIALS (HUNTINGTON II). 1970-1975. **Ludwig Braun,** State University of New York, Stony Brook, New York 11790. (Prior grantee: Polytechnic Institute of Brooklyn, Brooklyn, New York 11201. 1970-1972.)

Computer programs accompanied by student, teacher, and resource manuals ..... **DEC**

Biology:

BUFLO	Buffalo Herd Management Simulation
DIET	Dietary Evaluation Simulation
GENE 1	Genetics Simulation
HARDY	Hardy-Weinberg Law Simulation
LINK	Genetic Linkage Investigation
LOCKEY	Enzyme Experiment Simulation
MALAR	Simulated Malaria Eradication Program
PH	pH Effect on Enzyme Function
POLUT	Water Pollution Simulation
POP	Population Modeling Simulation
RATS	Rat Control Simulation
STERL	Sterile Male Pest Eradication
TAG	Wildlife Population Census Simulation

Physics:

CHARGE	Millikan Oil Drop Experiment
SCATR	Rutherford Scattering Package
SLITS	Young's Double Slit Experiment

Social Studies:

ELECT 1,2,3,	Election Simulation
LIMITS	Limits to Growth Model
MARKET	Elementary Marketing Simulation
POLICY	National Policy Formulation Simulation
POLSYS	City Government Simulation
SAP	Statistical Analysis Package
USPOP	Human Population Model of the United States

49. **UNIFIED MODERN MATHEMATICS:** SECONDARY SCHOOL MATHEMATICS IMPROVEMENT STUDY (SSMCIS). 1969- **Howard F. Fehr,** Teachers College, Columbia University, New York, New York 10027.

a. UNIFIED MODERN MATHEMATICS .... **TCP**
Student's Text and Teacher's Commentary are available for each of Courses 1 through 6.
Course 6 also includes the following Booklets:
Booklet A—*Introduction to Statistical Inference*
Booklet B—*Determinants, Matrices, and Eigenvalues*
Booklet C—*Algebra Structures, Extensions, and Homomorphisms*
Booklet D—*An Introduction to Differential Equations*
Booklet E—*Geometric Mappings and Transformations*

b. Other ..... SSMCIS
Information Bulletin No. 6 Mathematics Education in Europe and Japan
Information Bulletin No. 7 Description of SSMCIS Unified Mathematics Program
Technical Bulletins:
4. *Performance of SSMCIS Students on Level 2 Mathematics CEEB Examinations*

6. *SSMCIS Special Examination for Course 3 Students—1971*
7. *Performance of SSMCIS Students on PSAT, October, 1972*
8. Cumulative Test and Manual for Courses 1,2,3
9. *Suggested Cumulative Review Test for Courses, 4,5*
11. *Supplementary Topics and Manipulative Skills*
11. (Supp.) *Arithmetic Achievement in 7th and 8th Grade SSMCIS Classes of Montgomery County, Maryland*
12. *Attitudes Toward Mathematics. SSMCIS and Accelerated Non-SSMCIS Students* (Attitude scale items included)
13. *Brief Report on Technical Bulletin No. 12*

50. DEMONSTRATION AND EXPERIMENTATION IN COMPUTER TRAINING AND USE IN SECONDARY SCHOOLS. 1967-1971. **Thomas E. Kurtz,** Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire 03755.

a. Book and Booklets .. available from the project
Elementary Functions: An Algorithmic Approach (Preliminary Edition) (Higgins) (1970)
BASIC in Ten Minutes a Day (29 pp.)
School BASIC (81 pp.)
Data Reduction Programs for Introductory Physical Science (48 pp.)
Computer Course for Business Students (47 pp.)
Suggestions for Programs (21 pp)
Solving n Equations in n Unknowns (28 pp.)

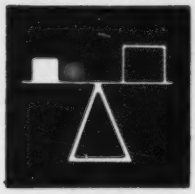
b. Book ..... **P-H**
The Elementary Functions: An Algorithmic Approach (Higgins) (1974)

c. Reports ..... available from the project
Demonstration and Experimentation in Computer Training and Use in Secondary Schools (48 pp.)
The Computer as a Pupil: The Dartmouth Secondary School Project Final Report

d. Paper ..... available from the project
"Secondary School Use of the Time-Shared Computer at Dartmouth College" (9 pp.) J. Danver and J. Nevison (1969)

51. **MODERN COORDINATE GEOMETRY.** 1964-1967. **Robert A. Rosenbaum,** Wesleyan University, Middletown, Connecticut 06457.

Information on materials and their availability is fully covered in NSF E 74-30



G. Physics, Physical Science

52. THE PROJECT PHYSICS COURSE (PPC). 1965-1969. **Gerald Holton,** Department of Physics; **Fletcher G. Watson** and **F. James Rutherford,** Graduate School of Education, Harvard University, Cambridge, Massachusetts 02138.

a. *The Project Physics Course, 1970* (Rutherford, Holton, Watson) ..... **HRW**
(1975 Revision also available)
Text and Handbooks
Student Readers for Units 1-6
Tests (Duplicating Masters) for Units 1-6
Resource Books for Units 1-6
Supplemental Units
Elementary Particles
Teacher notes
Discoveries in Physics
Teacher notes
Programmed Instruction Booklet Sets
Set 1 (Equations 1-3)
Set 2 (Vectors 1-3)
Set 3 (Waves 1-2, Kinetic-Molecular Theory of Gases)
Overhead Transparencies for Units 1-6
Super 8mm Filmloops (48 loops)

b. Laboratory Materials and Equipment ... **D/ED**

53. PHYSICAL SCIENCE STUDY COMMITTEE (PSSC). 1956-1968. **Uri Haber-Schaim,** Physical Science Group, School of Education, Boston University, 765 Commonwealth Avenue, Boston, Massachusetts 02215. (Grantees: Massachusetts Institute of Technology, Cambridge, Massachusetts 02139. 1956-1959; Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160. 1959-1968)

a. Texts and Guides ..... **DCH**
PSSC Physics Textbook, Third Edition, hardcover
PSSC Teacher's Resource Book and Guide, Third Edition, hardcover

Ch: **RCT**	Ja: **ISP**
Da: **GBNE**	Ko: **TDP**
Eng-Canada: **CCP**	No: **OUP**
Eng-Eng: **WHL**	Pe: **FBP-NY**
Eng-India: **NCERT**	Por-Brazil: **IBE**
Eng-Taiwan: **RCT**	Ru: **SPPMI**

Fr-Canada: **LHL**
Fr-France: **DE**
Ge: **FVS**
Gr: **MNER**
He: **YAC**
It: **NZEI**
Sp-Columbia: **ETB**
Sp-Spain: **ERBS**
Sw: **Bibl-AB, NKIS**
Tam: **BTP**
Tu: **RTME**
Yu: **YIER**

Achievement Tests, Third Edition

b. Science Study Series ..... **AB-DC**

The Series, planned under this project and now independently published, is a series of paperback books providing collateral reading for high school and college students and teachers interested in the physical, biological, environmental and social sciences, mathematics, and engineering.

The Birth of a New Physics: From Copernicus to Newton (Cohen)
Cloud Physics and Cloud Seeding: Introduction to Applied Meteorology (Battan)
Computers and the Human Mind: An Introduction to Artificial Intelligence (Fink)
Continental Drift (Tarling, Tarling)
Crystals and Crystal Growing: Order in Nature (Holden, Singer)
Discovering the Natural Laws: The Experimental Basis of Physics (Rothman)
Electrons and Waves: An Introduction to the Science of Electronics and Communication (Pierce)
Electrostatics: Exploring, Controlling, and Using Static Electricity (Moore)
Faraday, Maxwell, and Kelvin (MacDonald)
Friction: An Introduction to Tribology (Bowden, Tabor)
Gravity: Classic and Modern Views (Gamow)
Harvesting the Clouds: Advance in Weather Modification (Battan)
Horns, Strings & Harmony: The Science of Enjoyable Sounds (Benade)
How Old is the Earth? New Answers to an Ancient Riddle (Hurley)
Inquiry into Science: Its Domain and Limits (Schlegel)
Invention, Discovery and Creativity (Moore)
Knowledge and Wonder: The Natural World as Man Knows It (Weisskopf)
Lady Luck: The Theory of Probability (Weaver)
Lasers and Holography: An Introduction to Coherent Optics (Kock)
Life in the Universe: A Scientific Discussion (Ovenden)
Magnets: The Education of a Physicist (Bitter)
Moseley and the Numbering of the Elements (Jaffe)
The Nature of Violent Storms: Physics and the Weather (Battan)
Nerves and Muscles: An Introduction to Biophysics (Galambos)
Nuclear Power and the Public (Foreman)
Nuclear Science and Society (Cohen)
The Physical Foundations of General Relativity (Sciama)
Quantum Electronics: The Fundamentals of Transistors and Lasers (Pierce)
Relativity and Common Sense: A New Approach to Einstein (Bondi)
Shape and Flow: The Fluid Dynamics of Flow (Shapiro)
A Short History of Chemistry: An Introduction to the Ideas and Concepts of Chemistry (Asimov)
Sir Isaac Newton: His Life and Work (Andrade)
Sound Waves and Light Waves: The Fundamentals of Wave Motion (Kock)
The Speech Chain: The Physics of Biology of Spoken Language (Denes, Pinson)
Synthetic Polymers: Building the Giant Molecule (Billmeyer)
Thirty Years That Shook Physics: The Story of Quantum Theory (Gamow)
This Cybernetic World: of Men, Machines, and Earth Systems Parsegian)
The Tides: Pulse of the Earth (Clancy)
The Unclean Sky: A Meteorologist Looks at Air Pollution (Battan)
The Universe at Large: Views of Cosmology (Bondi)
Water: The Mirror of Science (Davis, Day)
The Watershed: A Biography of Johannes Kepler, Taken from "The Sleepwalker" (1959) (Koestler)
Waves and Beaches: The Dynamics of the Ocean Surface (Bascom)
Waves and Messages: (Pierce)
Waves and the Ear: What We Hear and How (van Bergeijk, Pierce, David)
Weather and Health (Landsberg)
Weather on the Planets: What We Know About Their Atmospheres (Ohring)

Recent information on publisher rights to this series, combined with information from the earliest years of the series, indicates the following distribution by language. It will be necessary to write to the publisher or to Anchor Books for information on specific titles available in each language.

Af: **T-U**
Ar: **FBP-NY, USIA**
Be: **FBP-NY**
Da: **GBNF**
Du: **NVUE**
Eng-England: **WHL**
Eng-Gt. Britain **AB-DC**
Fi: **WSOY**
Fr: **EP**
Ge: **VKD, WGV**
GR: **OPH**
He: **DC**
Hu: **T**
In: **FBP-NY**
It: **NZEI, GEE**
Ja: **KSS, BL**
No: **JWCF**
Pe: **FBP-NY**
Po: **PWN**
Por-Brazil: **IBE**
Ro: **AB-DC**
Ru: **SPPL**
S-C: **(UNK), AB-DC**
Sp-Argentina: **EUDBA**
Sw: **Bibl-Ab, NKIS**
Ur: **FBP-NY**

c. Laboratory Apparatus .... **EdMC, GEL, WSC**

d. Films (16mm, b&w and sound except as noted) ..... **MLA**

A Million to One (5 min.)
Behavior of Gases (Grodzins) (15 min.)
Change of Scale (Williams) (23 min.)
Collisions of Hard Spheres (Strickland) (19 min.)
Conservation of Energy (LaCroix, Zacharias) (27 min.)
Coulomb Force Constant (Rogers) (34 min.)
Coulomb's Law (Rogers) (30 min.)
Counting Electrical Charges in Motion (Strickland) (22 min.)
Crystals (Holden) (25 min., b&w, color)
Definite and Multiple Proportions (St. George, Zacharias) (30 min.)

Deflecting Forces (Frank) (30 min.)
Elastic Collisions and Stored Energy (Strickland) (27 min.)
Electric Fields (Bitter, Waymouth) (25 min.)
Electric Lines of Force (Joseph) (7 min.)
Electrical Potential Energy and Potential Difference: Parts I and II (Frank) (Part I: 30 min., Part II: 24 min.)
Electromagnetic Waves (Wolga) (33 min.)
Electrons in a Uniform Magnetic Field (Montgomery) (11 min.)
Elementary Charges and Transfer of Kinetic Energy (Friedman) (34 min.)
Elements, Compounds, and Mixtures (Johns) (33 min., color)
Elliptic Orbits (Baez) (19 min.)
EMF (Frank) (20 min.)
Energy and Work (Montgomery) (28 min.)
Forces (Zacharias) (23 min.)
Frames of Reference (Hume, Ivey) (28 min.)
Franck-Hertz Experiment (Youtz, Franck) (30 min.)
Free Fall and Projectile Motion (Frank) (27 min.)
Inertia (Purcell) (26 min.)
Inertia Mass (Purcell) (19 min.)
Interference of Photons (King) (13 min.)
Introduction to Optics (Little) (23 min., color)
Long Time Intervals (Brown) (25 min.)
A Magnet Laboratory (Bitter, Waymouth) (21 min.)
The Mass of Atoms: Parts I and II (Hertz, Brewer) (Part I: 20 min., Part II: 27 min.)
Mass of the Electron (Rogers) (18 min.)
Matter Waves (Holden, Germer) (28 min.)
Measurement (Siebert) (21 min.)
Measuring Large Distances (Watson) (29 min.)
Measuring Short Distances (Montgomery) (20 min.)
Mechanical Energy and Thermal Energy (Zacharias) (22 min.)
Millikan Experiment (Friedman, Redfield) (30 min.)
Moving With the Center of Mass (Branson) (26 min.)
Periodic Motion (Hume, Ivey) (33 min.)
Photoelectric Effect (Strong) (28 min., color)
Photons (King) (19 min.)
Pressure of Light (Zacharias) (23 min.)
Random Events (Hume, Ivey) (31 min.)
Rutherford Atom (Hulsizer) (40 min.)
Short Time Intervals (Searle) (21 min.)
Simple Waves (Shive) (27 min.)
Sound Waves in Air (Bolt) (35 min.)
Speed of Light (Siebert) (21 min.)
Straight Line Kinematics (Hafner) (34 min.)
Time and Clocks (King) (28 min.)
Universal Gravitation (Hume, Ivey) (31 min.)
Vector Kinematics (Friedman) (16 min.)

Da: **MLA** | It: **ESI**
Fi: **SEFBF** | Por-Br: **CURdJ**
Fr: **MLA** | Sp: **MLA**
Ge: **MLA** | Sw: **MLA**

54. PHYSICAL SCIENCE STUDY COMMITTEE—ADVANCED TOPICS SUPPLEMENT. 1960-1969. **Uri Haber-Schaim,** Physical Science Group, School of Education, Boston University, 765 Commonwealth Avenue, Boston, Massachusetts 02215. (Grantee: Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160.)

a. Text and guide ..... **DCH**
Advanced Topics Supplement, Third Edition
Textbook and laboratory guide
Teacher's Guide: Advanced Topics Supplement

b. *Achievement Tests, Third Edition* ..... **DCH**

c. Approved apparatus for Advanced Topics: **GEL, EdMC**

d. Advanced Topics Films ..... **MLA, UEVA**
All are 16mm, black and white, sound films
Angular Momentum: A Vector Quantity (Lemonick) (27 min.)
Frequency Spread and Lifetime, A Mechanical Analog (Strickland) (21 min.)
Positron-Electron Annihilation (Berko) (28 min.)
Reversible and Irreversible Processes (Ferretti) (20 min.)
Time Dilution, An Experiment with Mu-Mesons (Frisch, Smith) (36 min.)
The Ultimate Speed, An Exploration with High Energy Electrons (Bertozzi) (38 min.)

Da: **MLA** | Sp: **MLA**
Fr: **MLA** | Sw: **MLA**
It: **ESI**

H. Social Sciences

55. HUMAN BEHAVIOR CURRICULUM PROJECT (HBCP). 1974- . **John K. Bare,** Department of Psychology, Carleton College, Northfield, Minnesota 55057. (Grantee: American Psychological Association, 1200 Seventeenth Street, N.W., Washington, D.C. 20036.)

Questions about materials, which are now undergoing development, should be addressed to the project director. Announcement of availability will be made when distribution arrangements have been completed.

56. COMPARING POLITICAL EXPERIENCES (CPE). 1972- . **Howard D. Mehlinger,** Social Studies Development Center, 513 North Park Avenue, Indiana University, Bloomington, Indiana 47401. (Grantee: American Political Science Association, 1527 New Hampshire Avenue, N.W., Washington, D.C. 20036.)

Questions about materials, which are now undergoing development, should be addressed to the project director. Announcement of availability will be made when distribution arrangements have been completed.

57. EXPLORING HUMAN NATURE (EHN). 1970- . **Irven DeVore, Peter Dow, George Goethals,** and **Anita Gil,** Education Development Center, Inc., 15 Mifflin Place, Cambridge, Massachusetts 02138. (Grantee: Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160.)

a. Printed course materials ..... **EDC**

Unit 1. *Origins of Human Behavior*
Simulation: *The Natural Selection Experiment*

Unit 2. *Childhood and the Community*
Anthology of Cultures and Communities
Exploring Communities
Picture essay: *Portraits of Childhood*
Card-sort exercise: The Community Connection
Simulation: Kepsong: A Game of Time, Tasks, and People

Unit 3. *Coming of Age: Managing Transitions*

Unit 4. *The Individual in Society*

For each unit there is a student text, a teacher guide, and one or more films (see below). Other materials for teachers include:

Sources for Teachers, an anthology of writings by biologists, social scientists, and educators.
From Many Perspectives, for teacher workshops
An Overview of the Course and *Goals and How to Assess Them*

b. Films (16mm and color except as noted) . **EDC**

Unit 1. *The Manhunters* (20 min.)
Flo and Her Family (6 min.)
Rock-a-bye Baby (21 min.)
Chimpanzees of the Gombe National Park (10 min.)

Unit 2. *Preschool Life on the Kibbutz* (b&w, 18 min.)
Shimbuk: A Tibetan Village in Nepal (40 min.)
Hagit (8 min.)
The King of the Kalahari (filmstrip, 45 frames)

Unit 3. *Brian at Seventeen* (b&w, 28 min.)
Veronica (16 min.)
Louis (16 min.)
Keith Turns Eighteen (19 min.)
Tony (b&w, 14 min.)

Unit 4. *Eskimo Family Life: A Day on the Tundra* (15 min.)

58. PRIMATE BEHAVIOR UNIT. 1967-1971. **Sherwood L. Washburn** and **Phyllis Dohlinow,** Department of Anthropology, University of California, Berkeley, California 94720.

Commercial distribution arrangements are incomplete. Inquiries should be addressed to the project director.

59. SOCIOLOGICAL RESOURCES FOR THE SOCIAL STUDIES (SRSS). 1964-1972. **Robert C. Angell,** 503 First National Building, Ann Arbor, Michigan 48108. (Grantee: American Sociological Association, 1722 N Street, N.W., Washington, D.C. 20036.)

a. *Episodes in Social Inquiry Series,* short paperback instructional units ..... **ABI**
Leadership in American Society: A Case Study of Black Leadership

The Incidence and Effects of Poverty in the United States
Images of People
Testing for Truth: A Study of Hypothesis Evaluation
Social Mobility in the United States
Social Change: The Case of Rural China
Science and Society
Small group Processes
Religion in the United States
Family Form and Social Setting
Simulating Social Conflict
Migration Within the United States
Roles of Modern Women
Transitions
Class and Race in the United States
Family Size and Society
Divorce in the United States
The Early Twenties and the Late Sixties: Two Generation Gaps
Cities: Where People Live and Why
Contemporary Soviet Society
Population Change: A Case Study of Puerto Rico
Delinquency
Values in Mass Communication: A Study of the Western

b. A one-semester introductory sociology course, *Inquiries in Sociology* ..... **ABI**
Student Text
Instructor's guide
Overhead transparencies

c. *Readings in Sociology Series*, paperbound books—each containing 20 readings ..... **ABI**
Cities and City Life
Life in Families
Racial and Ethnic Relations
Delinquents and Criminals: Their Social World
Social Organizations
Population Growth and the Complex Society
Crowd and Mass Behavior

d. Teacher training
(1) For social studies methods classes and in-service training program, *Experiences in Inquiry* ..... **ABI**
(2) *Sociological Investigation in the Social Studies Class*, a teacher training film (27 min., 16mm, sound), shows a class working on an episode **AVEC**

60. **GEOGRAPHY IN AN URBAN AGE:** HIGH SCHOOL GEOGRAPHY PROJECT (HSGP). 1964-1972. **Dana Kurfman,** P.O. Box 1095, 2985 East Aurora, Boulder, Colorado 80302. (Grantee: Association of American Geographers, 1710 Sixteenth Street, N.W., Washington, D.C. 20009.)

a. *Geography in an Urban Age* ..... **MPC**
Unit 1. *Geography of Cities*
Unit 2. *Manufacturing and Agriculture*
Unit 3. *Cultural Geography*
Unit 4. *Political Process*
Unit 5. *Habitat and Resources*
Unit 6. *Japan*
For each of the above units, materials available include a teacher guide, a student response book, a student manual, transparencies, and, as appropriate, maps, data sheets, audio-visual materials, and educational games.

b. Additional publications:
(1) *The Local Community: A Handbook for Teachers* ..... **MPC**
(2) *High School Geography: New Insights,* a film for information and in-service teacher training (available for purchase or rental) .... **MPC**
(3) *Experiences in Inquiry: HSGP and SRSS* ... **ABI**
(4) *From Geographic Discipline to Inquiring Student* (1970), final report of the HSGP .... **AAG**
(5) *Activities Selected from the High School geography Project* (1971) ..... **AAG**
(6) *Sources of Information and Materials: Maps and Aerial Photographys* (1970) (available in microfiche) ..... **ERIC/ChESS**

61. ANTHROPOLOGY CASE MATERIALS PROJECT (ACMP): TECHNOLOGY AND SOCIETY. 1969- . **Robert G. Hanvey,** 914 Atwater, Indiana University, Bloomington, Indiana 47401.

Commercial distribution arrangements are incomplete. Inquiries should be addressed to the project director.

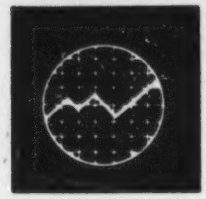
62. **PATTERNS IN HUMAN HISTORY:** ANTHROPOLOGY CURRICULUM STUDY PROJECT (ASCP). 1962-1972. **Malcolm Collier,** 5632 Kimbark Avenue, Chicago, Illinois 60637. (Grantee: American Anthropological Association, 1703 New Hampshire Avenue, N.W., Washington, D.C. 20009.)

Information on materials and their availability is fully covered in NSF E 74-30.

63. SPADEWORK FOR HISTORY, A FILM SERIES ON ARCHAEOLOGICAL RESEARCH. 1961-1964. **E. Mott Davis,** Department of Anthropology, University of Texas, Austin, Texas 78712.

The films are available from Communication Center, The University of Texas at Austin, P.O. Box 7158, Austin, Texas 78712 (16mm, color, sound, 29 min.)

Salvaging American Prehistory
The Woodlands (Eastern Woodlands)
The Plains
The Desert
Plateau and Pacific (Western Area)
Salvaging Texas Prehistory



I. Technology

64. **THE MAN-MADE WORLD** (TMMW): ENGINEERING CONCEPTS CURRICULUM PROJECT (ECCP). 1964. . **John G. Truxal,** State University of New York, Stony Brook, New York 11790. (Prior grantees: Commission on Engineering Education, Washington, D.C. 20036. 1964-1967; Polytechnic Institute of Brooklyn, Brooklyn, New York 11201. 1967-1972.)

a. Textbook ..... **M-HBC**
The Man-Made World
Ja: **M-HBC** Ko: **M-HBC**

b. Teacher Manual ..... **M-HBC**
The Man-Made World
Transparency masters for *The Man-Made World*

c. Cassette Tapes & Workbooks ..... **AMF**
Introduction to Analog Computer
Linear Equation Experiments
Population Study

d. Laboratory Equipment ..... **AMF**

IV. RELATED PRE-COLLEGE PROJECTS

A. Coordination, Studies and Research

65. STANFORD MATHEMATICS EDUCATION STUDY GROUP. 1974- . **E.G. Begle,** Stanford University, Stanford, California 94305. (Grantee: Mathematical Association of American, 1225 Connecticut Avenue, N.W., Washington, D.C. 20036.)

The purposes of this project did not include production of instructional materials.

66. A SUMMER WORKING STUDY—MATHEMATICS CURRICULUM. 1973. **Jerrold R. Zacharias,** Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160.

The purposes of this project did not include production of instructional materials.

67. AN ANALYSIS OF OPERATIONAL SCHOOL MATHEMATICS CURRICULA. 1971- . **Robert B. Davis,** Curriculum Laboratory, University of Illinois, 1210 West Springfield Avenue, Urbana, Illinois 61801, and **Herbert Ginsburg** (Rand Hall, Cornell University, Ithaca, N.Y. 14850). Prior grantee: Syracuse University, Syracuse, N.Y. 13210. 1971-1973.)

The purposes of the project did not include production of instructional materials.

68. EVALUATION OF PROJECT SEED. 1971-1973. **Donald R. Kerr, Jr.,** Department of Mathematics, Indiana University, Bloomington, Indiana 47401.

The purposes of this project did not include production of instructional materials.

69. MATHEMATICAL PROBLEM SOLVING. 1971- . **Joseph M. Scandura,** Graduate School of Education, University of Pennsylvania, Philadelphia, Pa. 19104.

The purposes of this project did not include production of instructional materials.

70. A LONGITUDINAL COMPARATIVE STUDY OF THE EFFECTS AND IMPACTS OF **MAN: A COURSE OF STUDY.** 1974- . **Stephen B. Plumer** and **H. Russell Cort, Jr.,** Antioch College, 2139 Wisconsin Avenue, N.W., Washington, D.C. 20007. (Grantee: Antioch College, Yellow Springs, Ohio 45387.)

Current Contact. H. Russell Cort, Jr., Division of Developing Programs, Antioch College, 2139 Wisconsin Ave., N.W., Washington, D.C. 20007.

The purposes of this project did not include production of instructional materials.

71. A STUDY OF PHYSICS TEACHING. 1970-1974. **J.W. Ivany,** American Institute of Physics, 335 East 45th Street, New York, New York 10017.

Information on materials and their availability is fully covered in NSF E 74-30.

72. SEMINAR ON THE DIFFUSION OF NEW INSTRUCTIONAL MATERIALS AND PRACTICES. 1972- . **Lee Anderson, James Becker, Merrill Hartshorn,** and **W. Williams Stevens, Jr.,** Social Science Education Consortium, Inc., 855 Broadway, Boulder, Colorado 80302.

Information on materials and their availability is fully covered in NSF E 74-30.

73. SOCIAL SCIENCE EDUCATION CONSORTIUM (SSEC). 1967- . **Irving Morrissett,** Social Science Education Consortium, Inc., 855 Broadway, Boulder, Colorado 80302.

Civic Education for the Seventies (DeCecco) ..... **SSEC**
Concepts and Structure in the New Social Science Curricula (Morrissett) ..... **HRW**
Fundamental Ideas of Social Psychology (Weatherley) **SSEC**
Inservice Teacher Education to Support Utilization of New Social Science Curricula (Fox and Girault) ..... **SSEC**
Research-based Development: A Strategy for Educational Change in the 1970's (Borg) ..... **SSEC**
Social Science in the Schools: A Search for Rationale (Morrissett and Stevens) ..... **HRW**
Social Studies Curriculum Materials Data Book. Volumes I and II. (Semiannual *Data Book* supplements each year) ..... **SSEC**
Social Studies Projects Tour: An Informal Report (Risinger and Radz) ..... **SSEC**
Toward the Year 2000 (Boulding) ..... **SSEC**
The University Model and Educational Change (Ford) ..... **SSEC**

74. CAMBRIDGE CONFERENCE ON SCHOOL MATHEMATICS (CCSM). 1963-1971. **William T. Martin,** Education Development Center, Inc. (EDC), 55 Chapel Street, Newton, Massachusetts 02160.

Current Contact. John Joanou.

Information on materials and their availability is fully covered in NSF E 74-30.

75. AAAS COMMISSION ON SCIENCE EDUCATION (CSE). 1962- . **Arthur J. Livermore,** American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington, D.C. 20005.

Information on materials and their availability is fully covered in NSF E 74-30.

76. SCHOOL MATHEMATICS STUDY GROUP (SMSG). 1958-1972. **E.G. Begle,** School of Education, Stanford University, Stanford, California 94305. (Original grantee: Yale University, New Haven, Connecticut 06520. 1958-1961.)

a. *Mathematics for the Elementary School* ..... **ACV**
Book K, and Grades 4, 5, and 6
GR: **UNK** Sp: **ACV**

b. *Mathematics for the Elementary School—Special Editions* ..... **ACV**
Book K
Book 1
Developing Mathematics Readiness in Pre-School Programs

c. Texts for Slower Students ..... **ACV**
Introduction to Secondary School Mathematics
Introduction to Algebra

d. High School Texts ..... **ACV**
Programmed First Course in Algebra (Form H)
Intermediate Mathematics
Introduction to Matrix Algebra
Analytic Geometry
Algorithms, Computation and Mathematics (including Fortran and Algol)
Calculus
Calculus of Elementary Functions
Ch: **RCT** Por-Brazil: **EDART**
Eng-India: **NCERT** Sp: **ACV**
Fr-Canada: **LPL'UL** Tu: **RTME**
Po: **PWN**

e. Supplementary Materials ..... **ACV**
Mathematics Through Science
Measurement and Graphing
Graphing, Equations and Linear Functions
An Experimental Approach to Functions
Mathematics and Living Things
Probability
Primary Grades
Intermediate Grades
Classroom Set of Spinners: Primary Grades; Intermediate Grades
Introduction to Probability: Basic Concepts; Special Topics

f. *Reprint Series* ..... **ACV**
The Structure of Algebra
Prime Numbers and Perfect Numbers
What is Contemporary Mathematics
Mascheroni Constructions
Space, Intuition and Geometry
Nature and History of Computation of
Mathematics and Music
The Golden Measure
Geometric Constructions
Memorable Personalities in Mathematics:
Nineteenth Century
Twentieth Century
Finite Geometry
Infinity
Geometry, Measurement, and experience

g. *Studies in Mathematics* ..... **ACV**
Number Systems (SM-6)
Intuitive Geometry (SM-7)
Concepts of Algebra (SM-8)
Brief Course in Mathematics for Elementary School Teachers (SM-9)

Applied Mathematics in the High School (SM-10)
Mathematical Methods in Science (SM-11)
A Brief Course in Mathematics for Junior High School Teachers (SM-12)
Inservice Course for Primary School Teachers (SM-13)
Puzzle Problems and Games Project (SM-18)
Reviews of Recent Research in Mathematics Education (SM-19)
Mathematical Uses in our Everyday World (SM-20)
The Place of Meaning in Mathematics Instruction: Selected Research Papers of William A. Brownell (SM-21)
The Place of Meaning in Mathematics Instruction: Selected Theoretical Papers of William A. Brownell (SM-22)

h. *Soviet Studies in the Psychology of Learning and Teaching Mathematics* ..... **ACV**
Volume I. *The Learning of Mathematical Concepts*
Volume II. *The Structure of Mathematical Abilities*
Volume III. *Problem Solving in Arithmetic and Algebra*
Volume IV. *Problem Solving in Geometry*
Volume V. *The Development of Spatial Abilities*
Volume VI. *Instruction in Problem Solving*
Volume VII. *Children's Capacity for Learning Mathematics*
Volume VIII. *Methods of Teaching Mathematics*
Volume IX. *Problem Solving Processes of Mentally Retarded Children*
Volume X. *Teaching Mathematics to Mentally Retarded Children*
Volume XI. *Analysis and Synthesis as Problem Solving Methods*
Volume XII. *Problems of Instruction*
Volume XIII. *Analyses of Reasoning Processes*
Volume XIV. *Teaching Arithmetic in the Elementary School*

i. *NLSMA Reports* ..... **ACV**
Nos. 1, 2, and 3. Population Test Batteries X,Y, and Z, respectively
Nos. 4, 5, and 6. Description and Statistical Properties of X-, Y-, and Z- Population Scales, respectively
No. 7. The Development of Tests
No. 8. Statistical Procedures and Computer Programs
No. 9. Non-Test Data
Patterns of Mathematics Achievement
No. 10. In Grades 4, 5, and 6: X-Population
No. 11. In Grades 7 and 8: X-Population
No. 12. In Grades 7 and 8: Y-Population
No. 13. In Grade 9: Y-Population
No. 14. In Grade 10: Y-Population
No. 15. In Grade 11: Y-Population
No. 16. In Grade 10: Z-Population
No. 17. In Grade 11: Z-Population
No. 18. In Grade 12: Z-Population
No. 19. The Non-Intellective Correlates of Over- and Under-Achievement in Grades 4 and 6
No. 20. Correlates of Attitudes Toward Mathematics
Correlates of Mathematics Achievement
No. 21. Attitude and Role Variables
No. 22. Cognitive Variables
No. 23. Teacher Background and Opinion Variables
No. 24. School Community and Demographic Variables
No. 25. Teacher Assigned Grades
No. 26. Summary
No. 27. The Prediction of Mathematics Achievement
No. 28. Teacher Effectiveness in Mathematics Instruction
No. 30. Follow-up Study of the NLSMA Z-Population
No. 31. Characteristics of Successful Insightful Problem Solvers
No. 32. The Effects of Different Mathematics Curricula on Science Achievement in the Secondary School
No. 33. Intercorrelations of Mathematical and Psychological Variables

j. *ELMA Technical Reports* ..... **ACV**
Test Batteries, Description and Statistical Properties of Scales:
No. 1 ..... Kindergarten
No. 2 ..... Grade 1
No. 3 ..... Grade 2
No. 4 ..... Grade 3

k. *Secondary School Mathematics* ..... **ACV**
Student's Texts and Teacher's Commentaries for Chapters 1 through 28

l. *Secondary School Advanced Mathematics* ..... **ACV**
Student's Texts and Teacher's Commentaries for Chapters 1 through 8

m. *Secondary School Mathematics Special Editions* .. **ACV**
Student's Texts and Teacher's Commentaries for Chapters 1 through 9

n. *New Mathematical Library Monographs* ..... **RHI**
1. *Numbers: Rational and Irrational* (Niven)
2. *What is Calculus About?* (Sawyer)
3. *An Introduction to Inequalities* (Beckenbach, Bellman)
4. *Geometric Inequalities* (Kazarinoff)
5. *The Contest Problem Book* (Salkind)
6. *The Lore of Large Numbers* (Davis)
7. *Uses of Infinity* (Zippin)
8. *Geometric Transformations* (Yaglom)
9. *Continued Fractions* (Olds)
10. *Graphs and Their Uses* (Ore)
11. *Hungarian Problem Book I* (Rapaport)
12. *Hungarian Problem Book II* (Rapaport)
13. *Episodes from Early History of Mathematics* (Aaboe)
14. *Groups and Their Graphs* (Grossman, Magnus)
15. *Mathematics of Choice* (Niven)
16. *From Pythagoras to Einstein* (Friedrichs)
17. *The MAA Problem Book II* (Salkind)
18. *First Concepts of Topology* (Chinn, Steenrod)
19. *Geometry Revisited* (Coxeter, Greitzer)
20. *Invitation to Number Theory* (Ore)
21. *Geometric Transformations II* (Yaglom)
22. *Elementary Cryptanalysis* (Sinkov)

23. *Ingenuity in Mathematics* (Honsberger)
24. *Geometric Transformations III* (Yaglom)
25. *The MAA Problem Book III* (Salkind, Earl)

Ch: **HF, RCT**
Po: **PWN**
Da: **MUNKS**
Fr-France: **DE**
Hu: **MK**
It: **NZEI**
Ja: **KSS**
Ro: **ES**
Ru: **UNK**
Sp: **C&C**
Sw: **BP**
Tu: **SPAM**

B. Conferences

77. CONFERENCE ON PIAGET-TYPE RESEARCH. 1970-1971. **Myron F. Rosskopf** (deceased) Teachers College, Columbia University, New York, New York 10027.

Information on materials and their availability is fully covered in NSF E 74-30.

78. **MAN: A COURSE OF STUDY** CONFERENCES. 1974- . **Peter B. Dow,** Education Development Center, Inc., 15 Mifflin Place, Cambridge, Massachusetts 02138. (Grantee: Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160.)

Materials are in a developmental stage. For further information write to the project director.

79. CONFERENCE ON THE MIDDLE SCHOOL MATHEMATICS CURRICULUM. 1973. **Earl M.L. Beard,** Department of Mathematics, University of Maine, Orono, Maine 04473.

The purposes of this project did not include production of instructional materials.

80. CONFERENCE ON JUNIOR HIGH SCHOOL MATHEMATICS. 1973. **Uri Haber-Schaim,** Physical Science Group, Newton College of the Sacred Heart, Newton, Massachusetts 02159.

The purposes of this project did not include production of instructional materials.

81. CONFERENCE ON THE K-12 MATHEMATICS CURRICULUM. 1973. **George Springer,** Mathematics Education Development Center, Indiana University, Bloomington, Indiana 47401.

The purposes of this project did not include production of instructional materials.

82. A NATIONAL CONFERENCE TO CONSIDER THE ROLE IN HIGH SCHOOL OF INTERDISCIPLINARY LEARNING THROUGH INVESTIGATION AND ACTION ON REAL PROBLEMS. 1972-1974. **Earle L. Lomon,** Education Development Center, Inc. (EDC), 55 Chapel Street, Newton, Massachusetts 02160.

Information on materials and their availability is fully covered in NSF E 74-30.

83. CONFERENCE ON TEACHERS' CENTERS IN MATHEMATICS EDUCATION. 1973. **Thomas C. O'Brien,** Southern Illinois University, Edwardsville, Illinois 62025.

The purposes of this project did not include production of instructional materials.

C. Other

84. THE ADAPTATION OF PROGRAMMED TUTORING TO MATHEMATICS (Programmed Math Tutorial—PMT). 1971- . **Phillip L. Harris,** Department of Psychology, Indiana University, Bloomington, Indiana 47401.

Information on materials and their availability is fully covered in NSF E 74-30.

85. THE MATHEMATICS AIDS PROGRAM, 1967-1971. **Alvin N. Feldzamen,** Encyclopaedia Britannica Educational Corporation, 425 North Michigan Avenue, Chicago, Illinois 60611. (Grantee: Educational Broadcasting Corporation, 304 W. 58th Street, New York, New York 10019.)

Information on materials and their availability is fully covered in NSF E 74-30.

86. CENTER FOR UNIFIED SCIENCE EDUCATION (FUSE). 1972- . **Victor Showalter,** Federation for Unified Science Education, Box 3138, University Station, Columbus, Ohio 43210.

Information on materials and their availability is fully covered in NSF E 74-30.

87. VIDEO TAPE PROJECT. 1968-1973. **Helen D. Berwald,** Department of Education, Carleton College, Northfield, Minnesota 55057. (Original grantee: The Associated Colleges of the Midwest, 60 West Walton St., Chicago, Ill. 60610.)

Information on materials and their availability is fully covered in NSF E 74-30.

APPENDIX A

PROJECT ABBREVIATIONS—GRANTEE INSTITUTIONS—PROJECT NUMBERS

ACMP	Anthropology Case Materials Project (Indiana)	61
ACSP	*Patterns in Human History:* Anthropology Curriculum Study Project (American Anthropological Association)	62
BICP	Biomedical Interdisciplinary Curriculum Project (California Committee on Regional Medical Programs)	44
BSCS	Biological Sciences Curriculum Study (University of Colorado)	29
CBA	Chemical Bond Approach Project (Earlham)	35
CCSM	Cambridge Conference on School Mathematics (Education Development Center, Incorporated)	74
CHEM Study	Chemical Education Material Study (University of California, Berkeley)	34
COPES	Conceptually Oriented Program in Elementary Science (New York University)	9
CPE	Comparing Political Experiences	56
CSE	Commission on Science Education (American Association for the Advancement of Science)	75
ECCP	See TMMW	64
EEP	Environmental Experiments Program (Oak Ridge Associated Universities, Incorporated)	41
EHN	Exploring Human Nature (Education Development Center, Incorporated)	57
ES	Environmental Studies for Urban Youth (The Evergreen State College)	22
ESCP	*Investigating the Earth:* Earth Science Curriculum Project (American Geological Institute)	27
ESS	Elementary Science Study (Education Development Center, Incorporated)	10
ESSP	Elementary School Science Project (University of Illinois)	13
FUSE	FUSE Center for Unified Science Education (Federation for Unified Science Education)	86
HBCP	Human Behavior Curriculum Project	55
HSGP	*Geography in an Urban Age:* High School Geography Project (Association of American Geographers)	60
HSP	Human Sciences Program (Biological Sciences Curriculum Study Company)	21
HUNTING-TON II	Development of Computer Simulation Materials (SUNY at Stony Brook)	48
IPS	*Introductory Physical Science* (Education Development Center, Incorporated)	24
ISCS	*Probing the Natural World:* Intermediate Science Curriculum Study (Florida State)	23
ISIS	Individualized Science Instructional System (Florida State)	42

MACOS	*Man: A Course of Study:* Social Studies Curriculum Program (Education Development Center, Incorporated)	15
MAD-M	Madison Mathematics Project (University of Illinois)	4
MINNEMAST	Minnesota School Mathematics and Science Teaching Project (University of Minnesota)	8
OBIS	Outdoor Biology Instructional Strategies (University of California, Berkeley)	20
PMT	The Adaptation of Programmed Tutoring to Mathematics (Programmed Math Tutorial) (Indiana)	84
PPC	Project Physics Course (Harvard)	52
PS II	*Physical Science II* (Newton College of the Sacred Heart)	25
PSSC	Physical Science Study Committee (Education Development Center, Incorporated)	53
SAPA	*Science—A Process Approach:* Commission on Science Education (American Association for the Advancement of Science)	12
SCIS	Science Curriculum Improvement Study (University of California, Berkeley)	11
SMSG	School Mathematics Study Group (Stanford)	76
SRSS	Sociological Resources for the Social Studies (American Sociological Association)	59
SSEC	Social Science Education Consortium (Social Science Education Consortium)	73
SSMCIS	*Unified Modern Mathematics:* Secondary School Mathematics Curriculum Improvement Study (Teachers College, Columbia)	49
TMMW	*The Man-Made World:* Engineering Concepts Curriculum Project (ECCP) (SUNY at Stony Brook)	64
TSM	*Time, Space, and Matter:* Secondary School Science Project (SSSP) (Rutgers)	26
UICSM	University of Illinois Committee on School Mathematics (University of Illinois)	17
USMES	Unified Science and Mathematics for Elementary Schools (Education Development Center, Incorporated)	6

APPENDIX B

DIRECTORS AND PROJECTS

Directors	Project Number
Anderson, Lee	72
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Pallrand, George J.	26
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Ruderman, Harry D.	3
Rutherford, F. James	52
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Scandura, Joseph M.	69
Shamos, Morris H.	9
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Showalter, Victor	86
Sluss, Richard R.	22
Snyder, Richard C.	14
Snyder, William R.	23
Spengler, Kenneth C.	37, 38
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Directors	Project Number
Stanley, Wendell M.	33
Stevens, W. Williams, Jr.	72
Strong, Laurence E.	35
Suppes, Patrick	5
Truxal, John G.	64
Vetter, Richard C.	40
Washburn, Sherwood L.	58
Watson, Fletcher G.	52
Werntz, James H., Jr.	8
Wyatt, Stanley P., Jr.	13
Zacharias, Jerrold R.	66
Zwoyer, Russell E.	17, 19

APPENDIX C

ENGLISH LANGUAGE VERSIONS, TRANSLATIONS, AND ADAPTATIONS FOR OTHER COUNTRIES AND UNITED STATES TERRITORIES

By Language, Discipline and Project Number

Language	*Project Number*
English	
Australia	
Biology—BSCS Green Version. . .AAS	29
Social Sciences—MACOS. . .CDA	15
Canada	
Interdisciplinary—ISCS. . .SBC	23
Physics—PSSC written material. . .CCP	53
Science—SCIS. . .WJG	11
—ESS Units. . .IRP	10
Social Sciences—MACOS. . .CDA	15
Ceylon	
Biology—BSCS written material. . .CAAS	29
Denmark	
Physics—PSSC International Edition. . .Bibl-AB, DCH	53
England	
Biology—BSCS written material. . .UK	29
Physics—PSSC written material. . .WHL	53
Science—Science Study Series. . .WHL	53
Social Sciences—MACOS. . .CDA	15
Finland	
Physics—PSSC International Edition. . .Bibl-AB, DCH	53
Great Britain	
Biology—BSCS Green Version. . .JM	29
Science—Science Study Series. . .AB-DC	53
Guam	
Science—SCIS. . .DEG	11
Hong Kong	
Biology—BSCS Yellow Version. . .OxUP	29
Iceland	
Physics—PSSC International Edition. . .Bibl-AB, DCH	53
India	
Biology—BSCS Yellow Version. . .NCERT, UGCI	29
Chemistry—CHEMS written material. . .NCERT	34
—CHEMS films. . .NEIF	34
Mathematics—SMSG written material. . .NCERT	76
Physics—PSSC written material. . .NCERT	53
Ireland	
Social Sciences—MACOS. . .CDA	15
New Zealand	
Biology—BSCS written material. . .NZ/DE	29
Social Sciences—MACOS. . .CDA	15

Norway
Physics—PSSC International Edition. . .Bibl-AB, DCH 53
Overseas American and International Schools (Australia, Germany, Greece, Hong Kong, Indonesia, Italy, Japan, Laos, Malaysia, Morroco, Singapore, Taiwan, Thailand, Tunisia)
Social Sciences—MACOS. . .CDA 15
Pacific Islands
Interdisciplinary—ISCS. . .SBC 23
Science—SCIS. . .TTPI 11
Pakistan
Biology—BSCS Yellow Version. . .PTB 29
Philippines
Biology—BSCS Green Version. . .P 29
Interdisciplinary—ISCS. . .UPQC 23
Physical Science—IPS. . .UNK 24
Scotland
Social Sciences—MACOS. . .CDA 15
Singapore
Biology—BSCS written material. . .STAS 29
Sweden
Physics—PSSC written material. . .Bibl-AB, DCH 53
Taiwan
Physics—PSSC written material. . .RCT 53
USDESEA
Interdisciplinary—ISCS has been adopted for use in the junior high schools of the U.S. Dependent Schools, European Area, and is in use in a number of countries. . .SBC 23
Other—The following films are sold in English, in 16 mm, through the world by MLA:
CHEMS 34
Astronomy 28
IPS 24
Meteorology 37
PSSC 53
ESS 10
Afrikaans
Meteorology—Monograph Series. . .T-U 38
Science—Science Study Series. . .T-U 53
Arabic
Science—Science Study Series. . .FBP-NY, USIA 53
Bengali
Science—Science Study Series. . .FBP-NY 53
Burmese
Meteorology—Monograph Series. . .USIA 38
Chinese
Biology—BSCS written material. . .CUHK, RCT 29
Chemistry—CHEMS written material. . .RCT 34
Mathematics—SMSG written material. . .RCT, HF 76
Physics—PSSC written material. . .RCT 53
Danish
Biology—BSCS Blue Version. . .GBNF 29
Chemistry—CHEMS films. . .MLA 34
Mathematics—SMSG films and written material. . .MUNKS 76

Physics—PSSC written material. . .GBNF 53
—PSSC films. . .MLA 53
Science—SCIS. . .MUNKS 11
—Science Study Series. . .GBNF 53
Dutch
Biology—BSCS written material. . .S/R, UdNB 29
Meteorology—*Above the Horizon* (film). . .NFB 37
Science—Science Study Series. . .NVUE 53
Finnish
Meteorology—*Above the Horizon* (film). . .NFB 37
—Monograph Series. . .WSOY 38
Physics—PSSC films. . .SEFBF 53
Science—Science Study Series. . .WSOY 53
French
Biology—BSCS written material. . .CdPdP, LELI 29
Chemistry—CHEMS written material. . .DE, CdPdP, LELI 34
—CHEMS films. . .MLA, MFR 34
Mathematics—SMSG written material. . .DE, LPL, UL 76
—UICSM Vector Geometry Course. . .LEJ 17
Meteorology—Monograph Series. . .DE 38
Physical Science—IPS written material. . .IRP 24
Physics—PSSC written material. . .DE, LHL 53
—PSSC films. . .MLA 53
Science—SCIS. . .IRP 11
—ESS. . .M-HRL 10
—Science Study Series. . .EP 53
German
Chemistry—CHEMS films. . .MLA, IFDW 34
Meteorology—*Above the Horizon* (film). . .NFB 37
Physics—PSSC International Edition. . .FVS 53
—PSSC films. . .MLA 53
Science—SAPA. . .AUP 12
—Science Study Series. . .VKD, WGV 53
Greek
Chemistry—CHEMS films. . .EPIC 34
Mathematics—SMSG written material. . .UNK 76
Physics—PSSC written material. . .MNER 53
Science—Science Study Series. . .OPH 53
Gujerati
Chemistry—CHEMS written material. . .NCERT 34
Hebrew
Biology—BSCS written material. . .MEC 29
Chemistry—CHEMS written material. . .WIS 34
Physics. . .PSSC written material. . .YAC 53
Science. . .Science Study Series. . .DC 53
Hindi
Chemistry—CHEMS written material. . .MPVRA 34
Hungarian
Mathematics—SMSG written material. . .MK 76
Science—Science Study Series. . .T 53
Icelandic
Chemistry—CHEMS written material. . .AB 34

Indonesian
Biology—BSCS Green Version. . .UNK 29
Science—Science Study Series. . .FBP-NY 53
Italian
Biology—BSCS written material. . .NZEI, F 29
Chemistry—CHEMS written material. . .LP 34
—CHEMS films. . .ESI 34
Mathematics—SMSG written material. . .NZEI 76
Meteorology—*Above the Horizon* (film). . .NFB 37
—Monograph Series. . .NZEI 38
Physical Science—IPS and PSII written material. . .NZEI 24, 25
Physics—PSSC written material. . .NZEI 53
—PSSC films. . .ESI 53
Science—Science Study Series. . .NZEI, GEE 53
Japanese
Biology—BSCS written material. . .ICU 29
Chemistry—CHEMS written material. . .KYS 34
—CBA. . .ISP 35
Engineering—TMMW. . .M-HBC 64
Mathematics—SMSG written material. . .KSS 76
Meteorology—*Above the Horizon* (film). . .NFB 37
—Monograph Series. . .KSS 38
Physical Science—IPS. . .ISP 24
Physics—PSSC written material. . .ISP 53
Science—Science Study Series. . .KSS, BL 53
Korean
Biology—BSCS Green Version. . .UNK 29
Chemistry—CHEMS written material. . .TDP 34
Earth Science—ESCP. . .SNU 27
Engineering—TMMW. . .M-HBC 64
Physical Science—IPS. . .SESC 24
Physics—PSSC written material. . .TDP 53
Science—SAPA. . .SERK 12
Norwegian
Meteorology—*Above the Horizon* (film). . .NFB 37
Physics—PSSC Physics written material. . .OUP 53
Science—Science Study Series. . .JWCF 53
Persian
Biology—BSCS Green Version. . .FBP 29
Chemistry—CHEMS written material. . .FBP 34
Physics—PSSC written material. . .FBP-NY 53
Science—Science Study Series. . .FBP-NY 53
Polish
Mathematics—SMSG written material. . .PWN 76
Meteorology—Monograph Series. . .PWN 38
Science—Science Study Series. . .PWN 53
Portugese
Astronomy. . .IBE 13
Biology—BSCS written material. . .EUB, EDART, FUNBEC, GF 29
Chemistry—CHEMS. . .written material. . .FUNBEC, GF 34
Earth Science—ESCP. . .FUNBEC 27
Mathematics—SMSG written material. . .EDART 76

Meteorology—*Above the Horizon* (film). . .NFB 37
—Monograph Series. . .IBE, USIA 38
Physical Science—IPS and PSII written material. . .EDART, FUNBEC 24, 25
Physics—PSSC written material. . .IBE 53
—PSSC films. . .CURdJ 53
Science—Science Study Series. . .IBE 53
Punjabi
Chemistry—CHEMS written material. . .PU 34
Romanian
Mathematics—SMSG written material. . .ES 76
Science—Science Study Series. . .AB-DC 53
Russian
Biology—BSCS written material. . .UNK 29
Chemistry—CHEMS written material. . .PTBA 34
Mathematics—SMSG written material. . .UNK 76
Physics—PSSC written material. . .SPPMI 53
Science—Science Study Series. . .SPPL 53
Serbo-Croatian
Science—Science Study Series. . .UNK 53
Slovene
Biology—BSCS Blue Version. . .DZS 29
Spanish
Biology—BSCS written material. . .EC, EE, ELW, C&C, ER, ET, TICSA, UdV, UNdT 29
—BSCS films. . .IFB 29
Chemistry—CHEMS written material. . .EN-MC, ERBS 34
—CHEMS films. . .MLA 34
Earth Science—ESCP. . .C&C 27
Mathematics—SMSG written material. . .ACV, C&C 76
Meteorology—*Above the Horizon* (film). . .NFB 37
—Monograph Series. . .EUDBA 38
Physical Science—IPS and PSII written material. . .C&C, ERBS 24, 25
—IPS films. . .MLA 24
Physics—PSSC written material. . .ERBS, ETB 53
—PSSC films. . .MLA 53
Science—SAPA. . .CPR 12
—Science Study Series. . .EUDBA 53
—SCIS. . .RMC 11
Swedish
Chemistry—CHEMS films. . .MLA 34
Mathematics—SMSG written material. . .BP 76
Physics—PSSC written material. . .Bibl-AB, NKIS 53
—PSSC films. . .MLA 53
Science—Science Study Series. . .Bibl-AB, NKIS 53
—SCIS. . .SKV 11
Tagalog
Biology—BSCS written material. . .UPQC 29
Tamil
Physics—PSSC written material. . .BTP 53
Thai
Biology—BSCS Yellow Version. . .UNK 29
Chemistry—CHEMS written material. . .SST 34
Turkish
Biology—BSCS written material. . .UA 29

Chemistry—CHEMS written material. . .MECISE 34
Mathematics—SMSG written material. . .RTME, SPAM 76
Physical Science—IPS and PSII written material. . .TCM 24, 25
Physics—PSSC written material. . .RTME 53
Urdu
Science—Science Study Series. . .FBP-NY 53
Vietnamese
Biology—BSCS written material. . .UNK 29
Yugoslav
Physics—PSSC written material. . .YIER 53

APPENDIX D

CODE IDENTIFICATION

Language Codes

Af	Africaans	Ja	Japanese
Ar	Arabic	Ko	Korean
Be	Bengali	No	Norwegian
Bu	Burmese	Pe	Persian
Ch	Chinese	Po	Polish
Da	Danish	Por	Portuguese
Du	Dutch	Pu	Punjabi
Eng	English	Ro	Romanian
Fi	Finnish	Ru	Russian
Fr	French	S-C	Serbo-Croatian
Ge	German	Sl	Slovene
Gr	Greek	Sp	Spanish
Gu	Gujerati	Sw	Swedish
He	Hebrew	Ta	Tagalog
Hi	Hindi	Tam	Tamil
Hu	Hungarian	Th	Thai
Ic	Icelandic	Tu	Turkish
In	Indonesian	Ur	Urdu
It	Italian	Vi	Vietnamese
		Yu	Yugoslav

Translators, Publishers, Distributors
Codes, full names, and addresses

AAG	American Association of Geographers, 1710 Sixteenth Street, N.W., Washington, D.C. 20009
AAS	Australian Academy of Science
AB	Almenna Bokafelagid, Austurstraeti 18, Postholf 9, Reykjavik, Iceland
AB-DC	Anchor Books, Doubleday and Company, Inc., Garden City, New York 11531
ABI	Allyn and Bacon, Inc., 470 Atlantic Avenue, Boston, Massachusetts 02210
ACV	A.C. Vroman, Inc., 2085 E. Foothill Boulevard, Pasadena, California 91109
AGI	American Geological Institute, 9205 Leesburg Pike, Falls Church, Virginia 22041
AMF	AMF Electrical Products Development Division, 1025 North Royal Street, Alexandria, Virginia 22314
AP	Agathon Press, Inc., 150 Fifth Avenue, New York, New York 10011
API	Academic Press, Inc., 111 Fifth Avenue, New York, New York 10003
AUP	Arbeitsgruppe fur Unterrichtsforschung, Padagogisches Seminar der Universitat, 34 Gottingen, Wagnerstrasse 1 Ruf 43081, Germany
AVC-Ind	Audio-Visual Center, Indiana University, Bloomington, Indiana 47401
AVEC	Audio-Visual Education Center, University of Michigan, 416 Fourth Street, Ann Arbor, Michigan 48103
AWP	Addison-Wesley Publishing Company, Inc., Reading, Massachusetts 01867
BFA	BFA Educational Media, 2211 Michigan Avenue, Santa Monica, California 90404
Bibl-AB	Biblioteksforlaget AB, Smalandsgatan 4, Box 7211, S-103 84 Stockholm, Sweden
BL	Bungei Shunju Ltd., 4, 8-chome Ginza-Nishi, Chuo-ku, Tokyo, Japan

BMC	The Bobbs-Merrill Company, Inc., Pegasus Division, 4300 W. 62nd Street, Indianapolis, Indiana 46206
BP	Prisma Bokforlaget AB, Hollandargatan 23, S-111 60, Stockholm 45, Sweden
BSCS	Biological Sciences Curriculum Study, P.O. Box 930, Boulder, Colorado 80302
BTP	Bureau of Tamil Publications, Madras State, Madras, India
CAAS	Ceylon Association for the Advancement of Science
C&C	Editorial Norma-Manuel Carvajal & Cia, Calle 29 Norte 6B-40 Cali, Colombia
CCL	Cine-Chrome Laboratories, IMSSS Ventura Hall, Stanford, California 94305
CCP	The Copp Clark Publishing Co. Ltd., 517 Wellington Street West, Toronto 2B, Ontario
CDA	Curriculum Development Associates, Inc., Suite 414, 1211 Connecticut Avenue, N.W., Washington, D.C. 20036
CdPdP	Centre de Psychologie et de Pedagogie, 260 ouest, Rue Faillon, Montreal 327, P.Q. Canada
CPR	Commonwealth of Puerto Rico, Dr. Meliado, Secretary of Education, Department of Education, Hato Ray, Puerto Rico
CUHK	Chinese University of Hong Kong
CURdJ	Catholic University, Rio de Janeiro, Brazil
DC	The Dvir Company, Ltd., 58 Maze Street, Tel-Aviv, Israel
DCH	D.C. Heath & Company, 125 Spring Street, Lexington, Massachusetts 02173
DE	Dunod Editeur, S.A.; 92 Rue Bonaparte, F-75006 Paris
DEC	Software Distribution Center, Digital Equipment Corporation, Maynard, Massachusetts 01754
D/ED	Damon/Educational Division, 80 Wilson Way, Westwood, Massachusetts 02090
DEG	Department of Education (Guam), P.O. Box DE, Agana 96910
DZS	Drzavna Zalozba Slovenije, Mestni trg 26, P.O. Box 50-1, Ljubljana, Yugoslavia
EBEC	Encyclopedia Britannica Educational Corporation, 425 North Michigan Avenue, Chicago, Illinois 60611
EC	CIA Editorial Continental S.A. (CECSA), Calzada de Tlalpan 4620, Mexico City 22, Mexico
EDART	EDART-Sao Paulo Livrria Editora LTDA, Rua Jaquaribe, 47, Coixa Postal 4108, Sao Paulo, Brazil
EDC	Education Development Center, Inc., 55 Chapel Street, Newton, Massachusetts 02160
EdMC	Eduquip Macalaster Corporation, 1085 Commonwealth Avenue, Boston, Massachusetts 02215
EE	Editorial Estrada, Estrada Angel y Cia S.A., Bolivar 462-466, Buenos Aires, Argentina
ELW	Editorial Limusa Wiley SA, Arcos de Belen 75, Mexico City I.D.F.
EMC	Extension Media Center, University of California, 2232 Shattuck Avenue, Berkeley, California 94720
EN-MC	Editorial Norma, Manuel Carvajal & Cia., Apartado 4344, Bogota, Colombia
EP	Editions Payot-Paris, 106, Boulevard Saint-Germain, F-75006, Paris 6e, France
EPD	E.P. Dutton & Co., Inc., 201 Park Avenue, S., New York., New York 10003
EPIC	Esso Pappas Industrial Co., Athens Tower, Vas. Sofias & Messogion Avenues, Athens, 610, Greece
ER	Editorial Rueda
ERBS	Editorial Reverte S.A., Calle San Magin 26, Barcelona 6, Spain
ERIC/ChESS	ERIC Clearinghouse for the Social Studies, Boulder, Colorado 80308
ES	Editura Stiintifica, Bd. Republic ii7, Bucarest, Rumania
ESI	Esso Standard Italiana, Palazzo Esso, Piazzale dell 'Industria, 46 Rome, Italy
ET	Editorial F Trillas S.A., Av Cinco de Mayo 43 Apdo 10534, Mexico City 1, D.F.
ETB	Editorial y Tipografia Bedout, AP Aero No. 760, Medellin, Colombia, S.A.
EUB	Editora Universidade de Brasilia
EUDBA	EUDBA (Editorial Universitaria de Buenos Aires), Rivadavia 1571-3, Buenos Aires, Argentina

F	Giangiacomo Feltrinelli S P A, Via Andegari 6, I-20121 Milan, Italy
FUNBEC	Fundacao Brasileira para o Desenvolvinmento do Ensino de Ciencias, Caixa Postal 2921, Sao Paulo, Brazil
FBP	Franklin Book Programs, 2 Alborz Ave., Shah-Reza Ave, Tehran
FBP-NY	Franklin Book Programs, Inc., 801 Second Avenue, New York, New York 10017
FI	Films, Inc., 1144 Wilmette Avenue, Wilmette, Illinois 60091
FVS	Friedr Vieweg & Sohn GmbH, Burgplatz 1, P.O. Box 3367, D-33, Baunschweig, Germany
GBNF	Gyldendalske Boghandel Nordisk Forlag A/S, Klareboderne 3, DK-1001 Copenhagen K., Denmark
GC	Ginn and Company, Xerox Education Group, 191 Spring Street, Lexington, Massachusetts 02173
GEE	Giulio Einaudi Editore, Via Umberto Biancamano 1, Torino, Italy
GEL	General Electronics Labs., Inc., 1085 Commonwealth Avenue, Boston, Massachusetts 02215
GF	Gulbenkian Foundation—Fundacao Calouste Gulbenkian, Lisboa 1, Portugal
HBJ	Harcourt Brace Jovanovich, Inc., 757 Third Avenue, New York, New York 10017
HF	Hsii Foundation, Taipei, Taiwan
HMC	Houghton Mifflin Company, One Beacon Street, Boston, Massachusetts 02107
HRP	Harper and Row Publishers, School Department, 2500 Crawford Avenue, Evanston, Illinois 60201
HRW	Holt, Rinehart and Winston, Inc., 383 Madison Avenue, New York, New York 10017
HS	Hickok Science, Wheeling Avenue, Woburn, Massachusetts 01801
HSC	Hubbard Scientific Company, P.O. Box 105, Northbrook, Illinois 60062
IBE	Instituto Brasilerio de Educacao, Ciencia e Cultura, (IBECC) Seccao De Sao Paulo, UNESCO, Sao Paulo, Brazil
ICU	International Christian University, Science Education Center, Mitaka, Tokyo, Japan
IFB	International Film Bureau, Inc., Chicago, Illinois
IFDW	Institut Fur Den Wissenschaftlichen Film, 34 Gottingen, Nonnenstieg 72, Germany
IRP	Institut de Recherches Psychologiques, Inc., 34 ouest, Rue Fleury, Montreal 357, Quebec, Canada
ISP	Iwanami Shoten Publishers, (I.K. Iwanami Shoten), No. 3, 2-Chome Kanda Hitosubashi, Chiyoda-Ku, Tokyo, Japan
JBL	J.B. Lippincott Company, East Washington Square, Philadelphia, Pennsylvania 19105
JM	John Murray Publishers, Ltd., 50 Albemarle St., London, England
JWCF	J.W. Cappelens Forlag A/S, Kirkegt. 15, Oslo, Norway
JWS	John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10016
KSS	Kawade Shobo Shinsha Co., Ltd., 3-6 Kanda-Ogawa-machi, Chiyoda-ku, Tokyo, Japan
KYS	Kyoritsu Shuppan Sha, Ltd., 6-19 Kobinata 4 Chome, Bunkyo-ku, Tokyo 112, Japan
LEJ	Les Editions Julienne, 1021 Rue Ste. Helene, Longueuil, Province of Quebec, Canada
LELI	Les Editions Lemeac, Inc., 5111 Rue Durocher Avenue, Outremont, Quebec H2V-3X7, Canada
LHL	Librarie Hachette, Ltd., 5 Rue St. Jacques Est., Montreal Canada
LP	La Prora, Via Telesio 4, 20145 Milano, Italy
LPL'UL	Les Presses de L'Universite Laval, C.P. 2447, Quebec 2, Canada
MEC	Ministry of Education and Culture, Jerusalem
MECISE	Ministry of Education, The Commission for the Improvement of Science Education, Ankara, Turkey
MFR	Modern Film Rentals, 2323 New Hyde Park Road, New Hyde Park, New York 11040
M-HBC	McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, New York 10020
M-HRL	McGraw-Hill Ryerson, Ltd., 330 Progress Avenue, Scarborough, Ontario, Canada
MINNEMAST	Minnesota School of Mathematics and Science Center, University of Minnesota, 720 Washington Avenue, S.E., Minneapolis, Minnesota 55455

MK	Muszaki Konyvkaido Vallalat, (Publishing House of Technical Literature), Bajcsy Zsilinsky Utca 22, Budapest V
MLA	Modern Learning Aids, P.O. Box 1712, Rochester, New York 14603
MMC	Mind Matter Corporation, P.O. Box 345, Danbury, Connecticut 06810
MNER	Minnistry of National Education and Religion, Athens, Greece
MPC	Macmillan Publishing Company, 866 Third Avenue, New York, New York 10022
MPVRA	M.P. Vishwavidyalaya Rachna Akademi, Bhopal, India
MUNKS	Munksgaard, A/S, Norre Sog 35, DK-1370 Copenhagen K, Denmark
NCERT	National Council of Educational Research and Training, 16, King Road, New Delhi, India
NCTM	National Council of Teachers of Mathematics, 1906 Association Drive, Reston, Virginia 22091
NEIF	National Education and Information Films, Ltd., Bombay, India
NFB	National Film Board, P.O. Box 6100, Station A, Montreal 101, Canada
NKIS	Nki-Skolan, S:T Eriksgatan 33. Stockholm, Sweden
NVUE	N.V. Uitgeverasmaatschappij Elsevier, Spuistraat 110-112, Amsterdam, Holland
NZ/DE	Commonwealth of New Zealand, The Department of Education
NZEI	Nicola Zanichelli Editore, via Irnerio, 34 40126, Bologna, Italy
OPH	Olkos Publishing House (Greece)
OUP	Oslo University Press, Karl Johans Gate 47, Oslo 10, Norway
OxUP	Oxford University Press
P	Phoenix Publishing House, 315 Quezon Blvd. Extension, Quezon City, Philippines
P-H	Prentice-Hall, Inc., Englewood Cliffs, New Jersey 07632
PTB	Punjab Textbook Board
PTBA	Publisher to be announced
PU	Punjabi University, Patiala, India
PWN	Panstwowe Wydawnictwo "Wiedza Powszechna" ul. Jasna 26, Naukowe, (Polish Scientific Publishers), Ulica Miodowa 10, Warszawa, Poland
RCT	Ministry of Education, Republic of China, Taipei, Taiwan
RHI	Random House, Inc., School Division, 210 E. 50th Street, New York, New York 10022
RMC	Rand McNally & Company, P.O. Box 7600, Chicago, Illinois 60680
RTME	Republic of Turkey, Ministry of Education, Ankara, Turkey
SAM	Science and Mankind, Inc., P.O. Box 729, Boulder, Colorado 80302
SBC	Silver Burdett Company, 250 James Street, Morristown, New Jersey 07960
SEFBF	State Educational Film Board of Finland, Helsinki
SERK	Science Education Project, Ministry of Education, Republic of Korea, Room 535 Capitol Building, Seoul, Korea
SESC	Science Education Study Committee, 138 Yondo-dong, Dongdaimun-ku, Seoul, Korea
SKV	Skrivab, Verkstadsgatan 5, Box 4036, 350 04 Faxjo 4, Sweden
SNU	Seoul National University
SPAM	Society of Pure and Applied Mathematics, Istanbul, Turkey
SPPL	State Publishers of Physico-Mathematical Literature, Lenin Prospect 15, Moscow B-71, U.S.S.R.
SPPMI	Science Press of the Physics and Mathematics Institute, U.S.S.R.
S/R	Stam/Robijns, B.V.; Industrieweg 1, P.O. Box 48, Culemborg, Nederlands
SSEC	Social Science Education Consortium, Inc., 855 Broadway, Boulder Colorado 80302
SSMCIS	Secondary School Mathematics Improvement Study, Teachers College, Columbia University, New York, New York 10027
SST	Science Society of Thailand, Library Building, Chulalongkorn University, Phyatai Road, Bangkok, Thailand
STAS	Science Teachers Association of Singapore, 23 Nassim Road, Singapore 10
T	Tanesics Konyvkiado, Szakszervezeti Konyvkiado, Es Folyoiratkiado Vallalat, VIII. Mezo Imre ut 19/b, Budapest, Hungary

TCM	T.C. Milli Egitim Bakenligi Talim ve Terbiye Dairesi Baskanligi, Ankara, Turkey (Ministry of Education, Republic of Turkey)
TCP	Teachers College Press, 1234 Amsterdam Avenue, New York, New York 10027
TDP	Tamgu Dang Publishing Co., 112 Kyun Ji-Dong, Chongro-Ku, Seoul, Korea
TICSA	Editorial Texto E Imagen, S.A., Insurgentes Sur 1673, 3er. piso., Mexico 20, D.F.
TTPI	Trust Territory of the Pacific Islands, Office of the High Commissioner, Saipan, Mariana Islands 96950
T-U	Tafelberg-Uitgewers Beperk, 1 Dorp St., (P.O. Box 879), Capetown, South Africa
UA	University of Ankara, Turkey
UdV	Universidad del Valle, Apdo Aereo 2188, Cali, Colombia
UdNB	Uitgeverij de Nederlandsche Boekhandel, Beukenlaan 20, Baarn
UEVA	Universal Education and Visual Arts, Division of Universal City Studios, Inc., 100 Universal City Plaza, Universal City, California 91608
UGCI	University Grants Commission in India
UK	University of Keele, Keele, Staffordshire, England
UNdT	Univeridad Nacional de Tucuman, Argentina
UNK	Publisher unknown
UPQC	University of the Philippines Press, Gonzalez Hall, Diliman, D-505, Quezon City
USIA	United States Information Agency
VKD	Verlag Kurt Desch/GmbH Munchen, Romanstrasse 7-9, Munich 19, Germany
WBS	W.B Saunders Company, West Washington Square, Philadelphia, Pennsylvania 18105
WGV	Wilhelm Goldman Verlag GMBH, Neumarkter Str 22, Post fach 800709, 8 Munich 80
WHF	W.H. Freeman & Co., 660 Market Street, San Francisco, California 94104
WHL	William Heinemann, Ltd., 15-16 Queen Street, London, W. 1, England
WIS	The Weizmann Institute of Science, Rohovot, Israel
WJG	W.J. Gage Limited, 1500 Birchmount Road, Box 550, Scarborough Ontario, Canada
WSC	Welch Scientific Company, 7300 North Linder Avenue, Skokie, Illinois 60076
WSOY	Werner Soderstrom Osakeyhtio Bulevardi 12, 00120 Helsinki 12 (Shipping P.O. 10218)
YAC	Yachdav United Publishers Co., Ltd., 29 Carlebach Street, P.O. 1317, Tel Aviv, Israel
YIER	Yugoslav Institute for Educational Research, as represented by Savremena Skola

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